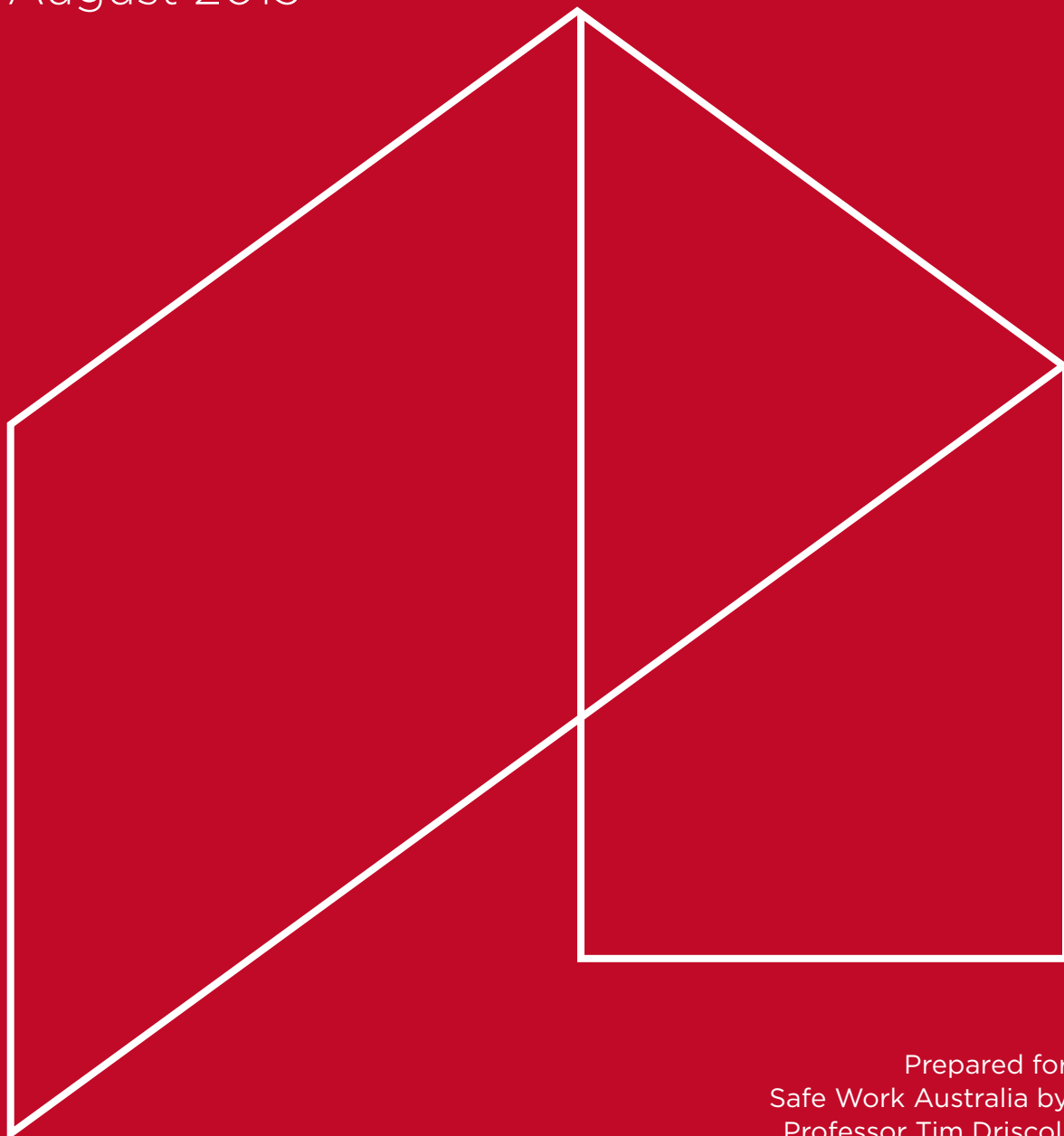




**safe work
australia**

DEEMED DISEASES IN AUSTRALIA

August 2015



Prepared for
Safe Work Australia by
Professor Tim Driscoll

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FOREWORD

This report was commissioned by Safe Work Australia to review the latest scientific evidence on the causal link between diseases and occupational exposures for use by Australian jurisdictions considering a revision to the deemed diseases list in their workers' compensation legislation.

Compared to work-related injuries, it is more difficult to prove that a disease was contracted in, or caused by, particular employment. In recognition of this, most jurisdictions in Australia have enacted special provisions in their workers' compensation legislation which deem specified occupational diseases as being caused by specified work related activities.

In most cases, the deemed diseases lists have not been updated since they were introduced and therefore do not include some diseases for which there is now strong evidence of a causal link to work-related exposures.

In August 2013, Safe Work Australia agreed to a project with the objective of developing an up-to-date Australian list of deemed diseases based on the most recent scientific evidence of a causal link between diseases and occupational exposure. The project was confined to the scientific work to develop a list of diseases and associated work exposures, the evidence for which was strong enough for inclusion in a list of deemed diseases.

While the project involved consultation via the representative membership of Safe Work Australia, no public consultation was undertaken, nor did the project include an assessment of the impact of updating the deemed diseases lists in Commonwealth, state or territory workers' compensation schemes.

Safe Work Australia agreed that impact assessment, consideration of inclusion of information in the deemed disease list itself or in guidance material and/or public consultation were more appropriately undertaken at jurisdictional level by those jurisdictions considering revising their own deemed diseases lists.

While the report was developed primarily for use by jurisdictions, Safe Work Australia agreed to publish the report as it provides useful evidence-based information for anyone involved in the prevention or compensation of occupational disease.

Safe Work Australia would like to thank Professor Tim Driscoll, an independent consultant in epidemiology and occupational medicine, who developed the report; Professor Malcolm Sim from Monash University who peer reviewed the report; and members of the Temporary Advisory Group representing the Commonwealth, all states and territories, unions and employer groups who provided advice during the development of the report.

Safe Work Australia,
August 2015

TABLE OF CONTENTS

FOREWORD	v
ACKNOWLEDGEMENTS	x
ABBREVIATIONS	xi
EXECUTIVE SUMMARY	xii
1 Introduction	1
1.1 Background	2
1.2 Project objective and aims	2
1.3 Outline of the structure of the report	3
2 CRITERIA AND FORMAT OF THE RECOMMENDED LIST	5
2.1 Criteria used to develop list of deemed diseases	6
1. Strong causal link between the disease and occupational exposure	6
2. Clear diagnostic criteria	6
3. The disease comprises a considerable proportion of the cases of that disease in the overall population or in an identifiable subset of the population	6
2.2 Format of the proposed list of deemed diseases	6
3 METHODS	7
4 ISSUES RELEVANT TO THE DEVELOPMENT OF THE LIST OF DEEMED DISEASES	9
4.1 Introduction	10
4.2 Considerations relevant to the criteria	10
Criterion 1: Strong causal link between the disease and occupational exposure	10
Criterion 2: Clear diagnostic criteria	11
Criterion 3: The disease comprises a considerable proportion of the cases of that disease in the overall population or in an identifiable subset of the population	12
Attributable fraction and population attributable fraction	12
Focus on specific diseases	14
Focus on specific exposures	14
Exposure circumstances	15
Sufficient exposure	15
Latency	16
Non-occupational exposure	16

5 EVIDENCE USED TO DEVELOP LIST OF DEEMED DISEASES	17
5.1 Introduction	18
5.2 Infectious diseases	18
Brucellosis	18
HIV/AIDS	18
Legionellosis	19
Leptospirosis	19
Pneumococcal disease	19
Q fever	19
Tuberculosis	20
Viral hepatitis	20
Other infections	20
5.3 Malignancy	21
General considerations	21
Chemotherapeutic agents	22
5.4 Mental or neuropsychiatric diseases	23
5.5 Neurological Diseases	24
Chronic solvent-induced toxic encephalopathy	24
Dementia	24
Parkinson's disease	24
Peripheral neuropathy	24
5.6 Noise induced hearing loss	25
5.7 Cardiovascular diseases	25
5.8 Respiratory diseases	26
Chronic obstructive pulmonary disease	26
Asthma	26
Pneumoconioses	27
Byssinosis	27
Extrinsic allergic alveolitis	27
5.9 Hepatic diseases	28
5.10 Skin diseases	28
Irritant and allergic contact dermatitis	28
Vitiligo	29

5.11 Musculoskeletal diseases	29
Introduction to upper limb diseases	29
Rotator cuff syndrome	30
Lateral and medial epicondylitis	30
Radial nerve entrapment and ulna nerve entrapment	31
Carpal tunnel syndrome	32
Occupational overuse syndrome	33
Forearm, hand and finger tendonitis and non-specific forearm pain	33
Raynaud's disease	33
Bursitis	33
Low back pain	33
Osteoarthritis	34
Scleroderma	34
5.12 Vibration diseases	34
5.13 Diseases of the genitourinary system	34
5.14 Reproductive risks	35
5.15 Acute chemical poisoning / toxicity	35
5.16 Multiple chemical sensitivity	35
6 RECOMMENDED AUSTRALIAN SPECIFIC LIST OF DEEMED DISEASES	37
6.1 Recommended content of Deemed Disease List	38
6.2 Diseases not recommended for inclusion on the proposed Deemed Disease List	42
7 RECOMMENDED GUIDANCE MATERIAL	45
7.1 Introduction	46
7.2 Guidance material	46
Infectious diseases	46
Malignancies	50
Neurological diseases	63
Noise-induced hearing loss	64
Respiratory diseases	65
Hepatic diseases	66
Skin diseases	68
Musculoskeletal diseases	69
Acute poisoning / toxicity	70
8 MAPPING OF ILO LIST TO LIST OF DEEMED DISEASES	71
8.1 Introduction	72
9 REFERENCES	81

LIST OF TABLES

Table 2.1	Carcinogen-cancer pairs classified by IARC as having sufficient evidence of a causal association—by cancer type	21
Table 6.1	Recommended content of Deemed Disease List	38
Table 6.2	Diseases recommended not to be included on the List, with justification against the project criteria	42
Table 8.1	Comparison of ILO Schedule 42 List of Occupational Diseases and the proposed Deemed Diseases List	72
Table 8.2	Comparison of ILO Recommendation 194 List of Occupational Diseases and the proposed Deemed Diseases List	73

ACKNOWLEDGEMENTS

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This report was prepared by the author on behalf of the Temporary Advisory Group (TAG) established by the Strategic Issue Group for Workers' Compensation. The author would like to thank the members of the TAG for their guidance; the peer reviewer for his helpful comments and suggestions; and staff at Safe Work Australia for their assistance in conducting the project and in preparing this report.

ABBREVIATIONS

AF	Attributable fraction
COPD	Chronic obstructive pulmonary disease
HAV	Hepatitis A virus
HBV	Hepatitis B virus
HCV	Hepatitis C virus
IARC	International Agency for Research on Cancer
PAF	Population Attributable Fraction
PTSD	Post-traumatic stress disorder
TAG	Temporary Advisory Group

EXECUTIVE SUMMARY

BACKGROUND

Most jurisdictions in Australia have a Deemed Diseases List as part of their workers' compensation system. This List comprises a list of diseases that are deemed to be work-related. The effect of this is to reverse the onus of proof. A worker with the disease who has been exposed to the relevant exposure in the course of their work is assumed to have developed that disease because of the exposure unless there is strong evidence to the contrary. Diseases that are not included on the List can still be the subject of a workers' compensation claim through the normal approach, where the reverse onus of proof would not apply. The Deemed Diseases approach simplifies relevant claims on the assumption that there is a high likelihood that the disease has arisen as a result of work-related exposures.

The Deemed Diseases lists in use in Australia are not commonly used as the basis for claims. There are probably several reasons for this, particularly that the lists are not up to date and are not well structured to facilitate claims to be made under Deemed Diseases legislation. As a result of these issues, Safe Work Australia undertook a project to develop an up-to-date Australian List of Deemed Diseases, based on the latest scientific evidence. A Temporary Advisory Group (TAG) was established by the Strategic Issue Group for Workers' Compensation. The group included representatives of each jurisdiction, the Australian Council of Trade Unions, the Australian Chamber of Commerce and Industry and the Australian Industry Group. An expert in occupational medicine and occupational epidemiology was engaged to work with the TAG on the project.

The Deemed Diseases project commenced in late 2013. This report documents the conduct and results of the project.

METHODS

The information in this report is based on published literature, relying where possible on systematic reviews. No new investigations were undertaken to obtain information on exposure or risk. The criteria used to determine which diseases and associated exposures should be included on the List were:

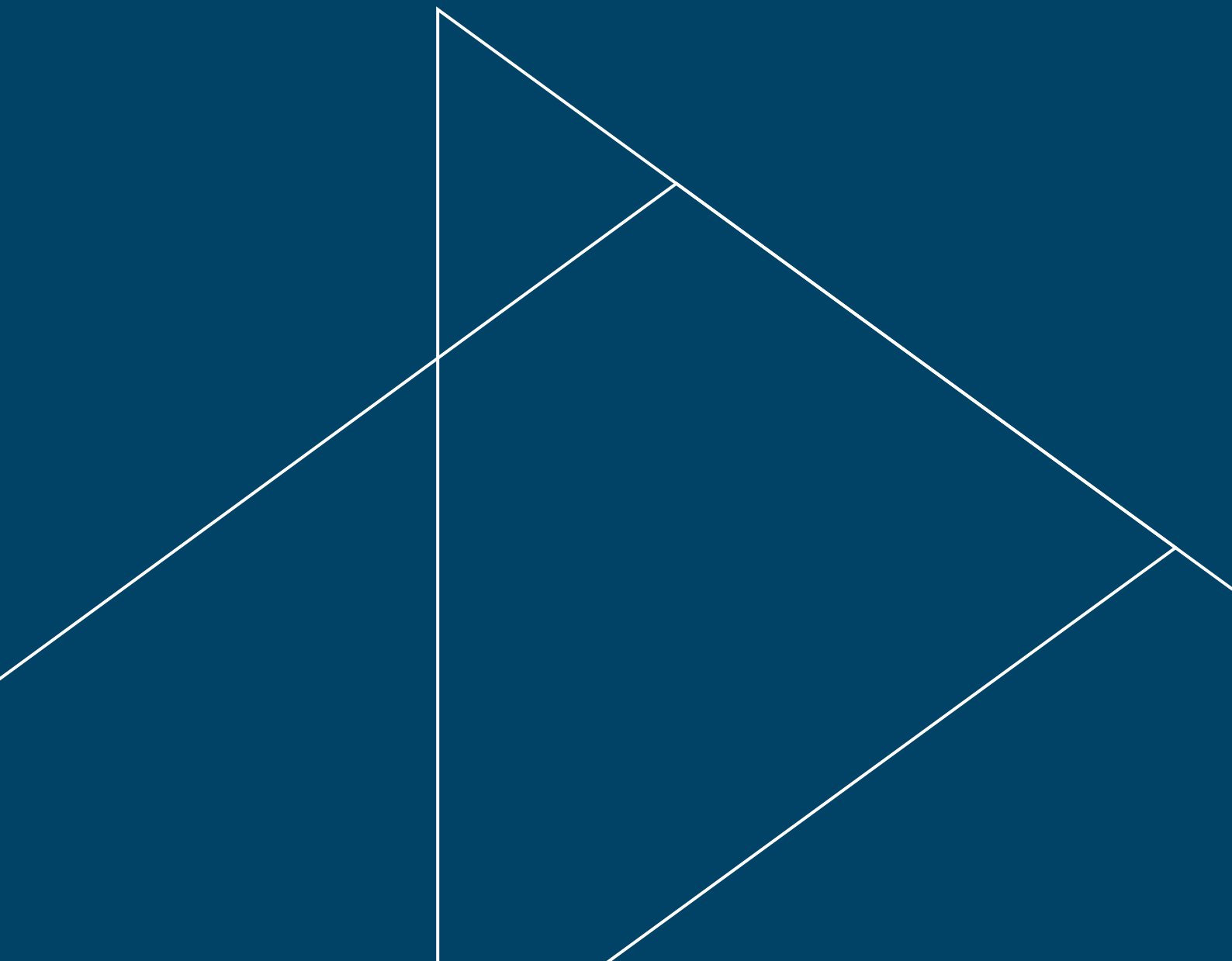
1. Strong causal link between the disease and occupation exposure.
2. Clear diagnostic criteria.
3. The disease comprises a considerable proportion of the cases of that disease in the overall population or in an identifiable subset of the population.

The structure of the recommended List was based on specific diseases and the relevant associated exposures.

RESULTS

Potential diseases and their associated exposures were considered for inclusion on the recommended List, using the three criteria and scientific evidence from the published literature. The diseases and exposures were grouped into those that are and are not recommended for inclusion. For those diseases and associated exposures recommended for inclusion, draft guidance material has been developed for the use of potential claimants and persons involved in considering the claims. A comparison is also made of the recommended List with ILO Schedule 42 and ILO Recommendation 194.

1 INTRODUCTION



1.1 BACKGROUND

Most jurisdictions in Australia have a Deemed Diseases List as part of their workers' compensation system. This List comprises a list of diseases that are deemed to be work-related. The effect of this is to reverse the onus of proof. A worker with the disease who has been exposed to the relevant exposure in the course of their work is assumed to have developed that disease because of the exposure unless there is strong evidence to the contrary. Diseases that are not included on the List can still be the subject of a workers' compensation claim through the normal approach, where the reverse onus of proof would not apply. The Deemed Diseases approach simplifies relevant claims on the assumption that there is a high likelihood that the disease has arisen as a result of work-related exposures.

The Deemed Diseases lists in use in Australia are not commonly used as the basis for claims. There are probably several reasons for this. The Lists were originally developed many decades ago. In most jurisdictions, they have not been updated since their legislation came into effect and in many the List is based on the International Labour Organization's List of Occupational Diseases under Convention 42 created in 1934. In other jurisdictions, one or two diseases have been added to the list without the whole list being reviewed. As a result, the lists appear not to include many diseases for which there is strong evidence of connection to occupational exposures. Also, the connection between the disease and the exposure is commonly not clear enough to easily support a claim even for diseases which do seem to be included on a List.

As a result of these issues, Safe Work Australia undertook a project to develop an up-to-date Australian List of Deemed Diseases, based on the latest scientific evidence. A Temporary Advisory Group (TAG) was established by the Strategic Issue Group for Workers' Compensation. The group included representatives of each jurisdiction, the Australian Council of Trade Unions, the Australian Chamber of Commerce and Industry and the Australian Industry Group. An expert in occupational medicine and occupational epidemiology was engaged to work on with the TAG on the project.

1.2 PROJECT OBJECTIVE AND AIMS

The objective of the project was to develop an up-to-date Australian List of Deemed Diseases based on the most recent scientific evidence on the causal link between diseases and occupational exposure. The aim of creating such a list was to streamline access to workers' compensation, improve fairness and clarity and to reduce the likelihood of disputation. Although not a stated aim of the project, it was expected that the project would raise awareness and alert people to the importance of prevention and that measures can be taken to reduce the incidence of occupational disease.

The Deemed Diseases project commenced in late 2013. This report documents the conduct and results of the project.

1.3 OUTLINE OF THE STRUCTURE OF THE REPORT

The report has nine main chapters. Chapter 1 provides an introduction to the project. Chapter 2 presents the criteria used to develop the recommended List of Deemed Diseases and the format of the List as agreed by the TAG. Chapter 3 describes the project methodology. Chapter 4 considers issues relevant to the development of the proposed List. Chapter 5 contains the main information regarding potential work-related diseases and the strength of evidence concerning their possible connection to work-related exposures. It also discusses the appropriateness of each disease for inclusion in the proposed List and makes recommendations about this. Chapter 6 contains the formal recommendations for the proposed List. Chapter 7 contains the recommend guidance material to accompany the List, and Chapter 8 provides a comparison of the proposed List to the lists contained in ILO Convention 42 and ILO Recommendation 194. This is followed by the references.



2 CRITERIA AND FORMAT OF THE RECOMMENDED LIST

2.1 CRITERIA USED TO DEVELOP LIST OF DEEMED DISEASES

Three criteria were used to determine diseases for inclusion on the List of deemed diseases. These were:

1. Strong causal link between the disease and occupational exposure

For this criterion, 'strong evidence' was defined as arising from (a) categorisation by the International Agency for Research into Cancer (IARC) as Group 1—human carcinogen (for cancers), or (b) a systematic review of the evidence or multiple good quality studies showing a causal relationship between the disease and the occupational exposure.

2. Clear diagnostic criteria

It is important that diseases included in a scheduled list have clear diagnostic criteria. This will mean there should be little question as to whether or not the claimant really has the disease that is the subject of the claim.

3. The disease comprises a considerable proportion of the cases of that disease in the overall population or in an identifiable subset of the population

A considerable proportion of the cases of that disease in the overall population or in an identifiable subset of the population are known or likely to be due to the relevant occupational exposure.

2.2 FORMAT OF THE PROPOSED LIST OF DEEMED DISEASES

The TAG determined that the List should contain entries based on specific diseases, with direct and explicit links to the relevant exposures.

Guidance material was developed for each proposed entry on the List. This guidance material was developed as an adjunct to the List rather than as part of the List, as directed by the TAG.



3 METHODS

The information in this report is based on a focussed review of the scientific literature and discussions with relevant jurisdictional representatives. The primary literature search was conducted via Medline and PubMed, but broader searches (using EMBASE, SCOPUS and general web searches) were undertaken for specific diseases and exposures. Grey literature was sought (via web searches) and used when there was a lack of definitive evidence in the published literature.

The primary search terms used were the [name of the disease] and ["work" OR "occupation"], with modified searches undertaken guided by the results of the initial search and the reference list of articles identified as being of use.

There was a focus on review articles where possible, but individual studies were included when review articles were insufficient, which was commonly the case. The report also in part draws on work undertaken by the project officer for a similar project in New Zealand and documented elsewhere^{1,2}. No new primary investigations were undertaken to obtain information on exposure or risk.

The methodological rigour of review articles and individual articles was taken into account when considering the information in an article, but there was no formal quality scoring system used. No new systematic reviews or meta-analyses were undertaken for the project. The decisions regarding carcinogens were based on the IARC Monographs, which summarise all the available human, animal and mechanistic and other relevant data, taking explicit account of the methodological strengths and weaknesses of the studies.

The project was conducted under the guidance of the TAG, which made recommendations in response to suggested approaches and draft content during the project.



4 ISSUES RELEVANT TO THE DEVELOPMENT OF THE LIST OF DEEMED DISEASES

4.1 INTRODUCTION

All jurisdictions in Australia provide some form of workers' compensation scheme. For most work-related diseases, the worker (the claimant) must establish that there is a causal connection between a particular work exposure and the disease on which the claim is based. This appears a sensible approach where there is significant uncertainty as to whether a particular exposure does indeed cause the disease. However, where there is strong evidence of a causal connection between the exposure and the disease, there seems little point expending time and resources requiring each individual worker to prove that connection. The Deemed Diseases approach reverses the onus of proof when a claim is made, but does not guarantee the success of a claim. The worker still has to demonstrate they have had sufficient occupational exposure to the relevant exposure. Decisions regarding what exposure-disease pairs should be included in a Deemed Diseases List must therefore strike a balance between the strength of evidence required to accept a causal connection, the strength of evidence that the worker has a particular disease, and the likelihood that a given disease will have arisen as the result of a work-related exposure.

4.2 CONSIDERATIONS RELEVANT TO THE CRITERIA

Criterion 1: Strong causal link between the disease and occupational exposure

The Deemed Diseases approach requires an acceptance of a causal connection between a specific work-related exposure and disease that results from that exposure. Therefore, it is important that the causal link between the disease and one or more occupational exposures is well established.

Many single studies have identified an apparent relationship between an occupational exposure and disease. However, it is usually unwise to accept such an apparent relationship as true unless the finding has been replicated in several studies. This is because any single study may be subject to methodological flaws which may provide a biased result, and even studies with few flaws can produce spurious results simply due to chance. Relationships which have been identified in several separate studies provide stronger evidence, and systematic reviews and meta-analyses are usually even better. For this reason, a decision was made for this project that the only exposure-outcome pairs to be considered for inclusion would be those for which there was a good quality systematic review of the evidence, or multiple good quality studies, showing a causal relationship.

The strength of this causal link relates to the strength of evidence, not the size of the association between an exposure and a disease. It has been proposed that acceptance of causality in the occupational setting could or should be limited to exposure-disease pairs where the relative risk is two or more. This is because when the relative risk is two or more it can be shown that there is a 50% or higher probability that an exposed person with the disease of interest developed the disease because of the exposure. This is seen to neatly equate to the legal requirement in some circumstances of proof "on the balance of probabilities"³.

Limiting conditions on the List to those where the relative risk is two or more is simplistic and does not reflect the various complexities underlying any measure of relative risk from real world studies. These studies reflect cohorts of workers with a range of exposures of varying intensities and durations and followed up for varying lengths of time. The true risk of individual workers therefore would range considerably above and below the estimate of the relative risk. In addition, each estimate of relative risk has a range in which the true value probably lies (the confidence interval). This range might include numbers less than two when the estimate of the relative risk is more than two. Equally, the range might include numbers more than two when the estimate of the relative risk is less than two. This reinforces the fact that using a cut-off of two for the relative risk estimate is arbitrary.

The decision regarding the probability required to make a final determination in an individual case that a particular occupational exposure did or did not cause a particular disease is a legal one. This decision is not directly relevant to the decision as to whether there is sufficient evidence that a particular exposure can cause a particular disease. The approach taken with the List is to allow disorder-exposure pairs to be considered for inclusion when there is strong evidence (that is, consistent evidence in several good quality studies) that the true relative risk is greater than one—i.e., that the exposure is an independent cause of the disease. The size of that association (i.e. the size of the relative risk) is not relevant to that consideration, apart from needing to be greater than one and the 95% confidence interval not to include one.

Criterion 2: Clear diagnostic criteria

Diseases to be included on the List must be able to be diagnosed unambiguously. Otherwise there may be doubts about whether the person actually has the disease, leading to challenges to the claim, which the Deemed Diseases system is designed to avoid.

There are two aspects to the diagnosis of occupational diseases—identification of the pathological condition, irrespective of the cause, and identification that the cause was, or was not, an occupational exposure.

Clear diagnostic criteria would be expected to be present for virtually all the diseases considered for inclusion on the List, but even this can be difficult for some diseases. The diagnosis of chronic neuro-psychiatric conditions associated with solvent exposure is one such example^{4,5}.

For some important diseases that can be related to occupation, the second aspect is more difficult and the criteria for deciding on connection to an occupational exposure less clear. Occupational asthma is probably the most important example. Occupational asthma has varying definitions. Establishing an unambiguous connection to work is important but can be difficult⁶⁻¹⁰. The situation is similar for many musculoskeletal diseases that can be associated with work, such as those associated with upper limb pain^{11,12} and with skin diseases^{13,14}.

For occupational asthma, the direct connection to occupation is intrinsic to the diagnosis, and usually the diagnosis would need to be made by a medical practitioner with specialist experience in occupational medicine. This is likely to be the case for most conditions for which the diagnosis is not straightforward.

Criterion 3: The disease comprises a considerable proportion of the cases of that disease in the overall population or in an identifiable subset of the population

Not every disease that is known to be caused by work should be included on a Deemed Disease list. Where the disease is very common in the community but only rarely caused by work, it would usually be inappropriate to include the disease on the List because the vast majority of cases would be expected to be due to non-work exposures. To include every disease that has ever been shown to be caused by an exposure that occurred in connection to occupation would make the List very unwieldy and not be consistent with the Deemed Diseases approach.

Equally, it would not be appropriate to only include diseases in which occupational exposures were the majority cause. Lung cancer is a good example. Lung cancer is known to be caused by exposure to asbestos, and the most common circumstance in which asbestos exposure occurs is through work. However, the most common cause of lung cancer in the community is smoking. Excluding lung cancer from consideration because the main cause is non-occupational would mean that many people whose cancer is actually caused by occupational exposure to asbestos will find it much more difficult to receive appropriate compensation for their illness. In many instances, people may have had several exposures, some occupational and some non-occupational, that are causally associated with a particular disease. A common example is being a smoker and being exposed to a lung carcinogen. Separating the different contributions and establishing the “causative” exposure in such a situation is nearly always impossible. So, in the end, a decision about the appropriateness of compensation has to be decided on another basis, and several have been proposed¹⁵.

Occupational asthma is another example. Many studies have estimated that about 10% to 15% of asthma in adults in industrialised countries is due to occupational exposures^{16, 17}. This means that the other 85% to 90% of asthma cases are not due to occupational causes. Asthma is a common disease in Australia and a common cause of work-related morbidity. Excluding asthma from the List therefore might make it unnecessarily difficult for workers who genuinely have occupational asthma to make a claim.

Attributable fraction and population attributable fraction

Relevant to Criterion 3 are the concepts of attributable fraction and population attributable fraction, which are considered in this section. The proportion of cases of a particular disease that are due to work will vary considerably between groups within the general population and between different occupational groups. A disease that at a general population level is overwhelmingly non-occupational in origin might be primarily of occupational origin in certain sub-groups where workers commonly have exposures that increase the risk of developing the disease. Therefore, a disease that is usually due to non-occupational factors, but commonly due to occupation in workers with a specific exposure, could reasonably be included on the List if it is directly linked to that exposure. For example, cases of tuberculosis would usually not be caused by occupational exposures, but tuberculosis in a health care worker is much more likely to be due to exposure to the causative organism as a result of work activities. So, tuberculosis in general would not be included on the List, but tuberculosis in a health care workers might be. Similarly, bladder cancer may be much more likely to be due to occupational exposure in some occupational groups than others. This would not preclude bladder cancer from being included on the List, as long as it was directly linked with the relevant causative exposure(s).

The concepts being considered here are the Population Attributable Fraction (PAF) and the Attributable Fraction (AF). The PAF is the proportion of cases of a particular disease in the **general** population that is due to the exposure in question. The AF is the proportion of cases in the **exposed** population that are due to that exposure. For example, if the PAF for lung cancer related to asbestos is 2%, this means that about 2% of all cases of lung cancer in the community are due to occupational exposure to asbestos. However, it may be that in asbestos-exposed workers, the AF is 70%, which would mean that about 70% of all cases of lung cancer in asbestos-exposed workers are due to asbestos. The important difference is that the PAF considers all people, whether or not they are exposed, whereas the AF considers only people who are exposed. In terms of the Deemed Diseases approach, the AF is more relevant, because persons making a claim under Deemed Diseases legislation will have to demonstrate they have been exposed and that they have a particular disease. In that instance, the disease will be presumed to have been causally related to the exposure unless there is strong evidence to suggest otherwise.

Attributable fraction (and population attributable fraction) have not been explicitly and numerically taken into account with the decisions on which diseases are proposed for inclusion on the List, although the AF is implicitly considered in some instances. There are several reasons for this.

Both measures are dependent on the relative risk, which is the risk of the relevant disease in the exposed population compared to the risk of disease in a population without the exposure. The relative risk will vary depending on the exposure experience of the individual, although average values are available from the literature in many instances. The extent to which the level of exposure in a particular case, or in Australia in general, matches that in the studies which provide the required estimates of relative risk will commonly not be clear. The available relative risks typically come from studies based on cohorts of workers in North America and Europe, and the nature of the exposure will not necessarily have been the same as those in Australia.

The population attributable fraction in addition depends on the exposure prevalence—the proportion of people in the community who are exposed. This information is not known for many exposures, particularly in Australia. A recent study provides the first estimates of occupational exposure to carcinogens in Australia¹⁸. However, this information concerns current exposures rather than past exposures. For cancers, the relevant exposure will typically have first occurred many years beforehand, because of the usually lengthy period between exposure and the occurrence of the disease (the latency).

Also, for any one case there are many factors that would need to be taken into account when deciding whether or not a particular disease in a particular individual should be accepted to have arisen as a result of a particular occupational exposure. These factors include the timing of the exposure, the amount of the exposure, the likelihood of non-occupational exposure to the same hazard, the likelihood of occupational exposure to other hazards which could have caused the disease, and the likelihood of non-occupational exposure to other hazards which may have caused the disease.

Focus on specific diseases

The structure of the proposed List links a specific disease to a specific exposure(s). This contrasts with the ILO List of Diseases in Convention 42 and Recommendation 194, which are a mixture of specific and non-specific diseases.

Examples of a specific disease are “Mesothelioma diagnosed as caused by asbestos” and “Lung cancer diagnosed as caused by chromium VI”. It is usually straightforward to diagnose a person as having mesothelioma, and asbestos is virtually the only known cause of mesothelioma. It is also usually straightforward to diagnose a person as having lung cancer, although it is not possible to unequivocally establish whether or not an individual case of lung cancer arose as a result of chromium VI exposure (or any other exposure).

Most of the other diseases listed in the ILO List are non-specific. For example, *“Diseases of a type generally accepted by the medical profession as caused by chrome or its toxic compounds.”* Chromium and related compounds are associated with lung cancer, dermatitis, skin ulcers, perforation of the nasal septum, respiratory tract irritation, and chronic renal failure¹⁹. All of these diseases can be caused by exposures other than chromium. It is not helpful for a Deemed Diseases list to include, for example, all cases of dermatitis. Instead, the focus should be on dermatitis caused by exposure to chromium or its compounds. Therefore, the List is best structured primarily around the disease and with a direct link to a specific exposure, rather than being structured around the exposure. This format reflects the purpose of the Deemed Diseases approach, the List being designed to be used by persons with a particular disease, rather than by persons with a particular exposure. Therefore, an entry such as *“Diseases of a type generally accepted by the medical profession as caused by chrome or its toxic compounds.”*, as appears in the ILO List, would be better along the lines of “Dermatitis associated with occupational exposure to chromium”, “Lung cancer associated with occupational exposure to chromium”, and so on.

Focus on specific exposures

Asthma illustrates a related issue, in that there are probably hundreds of occupational exposures that could potentially cause asthma. So, it would not be practical to explicitly include them all on the List. This would also be the case for dermatitis. In contrast, it might well be feasible and appropriate to include on the List specific exposures that have been associated with a particular form of cancer.

For some diseases, connection to an occupation or task, rather than exposure to a specific agent, may be necessary. For most infections related to occupation, the infection is inextricably linked to exposure to a single agent—the infective organism. That is, there is a clear one-to-one relationship between the disease and an exposure. This differs from virtually all other diseases, in which the disease may have many causes. For infections, it makes more sense to identify the occupational circumstances in which exposure to the infective organism can be expected to occur, rather than to simply identify the infective organism, because identifying the infective organism doesn’t add any extra information. For example, Leptospirosis is more usefully linked to dairy farming and abattoir work than to exposure to leptospira, the causative exposure.

In general, the List should identify specific exposures in relation to a specific disease. Some variation in this approach is required when the disease can be clearly related to work but there are so many individual exposure types that have been shown to cause the disease. In that situation, the specific disease should be included, accompanied by a general reference to the many exposures that might cause it. In addition, for infections, the relevant exposure circumstances (usually summarised by the occupation) should be used.

Exposure circumstances

There are situations where there is very good evidence that work in a particular occupation increases the risk of developing a specific disease, but the specific agent has not been identified. An example of this is bladder cancer associated with rubber production. The International Agency for Research on Cancer lists twelve exposure circumstances that are classified as definitely increasing the risk of cancer and that are clearly (or occasionally) directly related to work. These exposure circumstances are consistently associated with an increased risk of cancer because they involve exposure to one or more specific carcinogens. In some instances, this exposure (or exposures) is known or strongly suspected. Indeed, one such exposure circumstance, employment in the boot and shoe industry, had been causally related to the occurrence of leukaemia and nasal adenocarcinoma and has since been removed from the IARC list because the relevant specific exposures (benzene and leather dust, respectively) have been identified²⁰. In other cases, the relevant exposure or exposures are not clear. These exposure circumstances do not lend themselves well to inclusion in a Deemed Diseases List. A single IARC exposure circumstance covers a range of different tasks and different exposures, only some of which may be carcinogenic. Therefore, many of the people included in the exposure circumstance will actually not have been exposed to whatever the causative exposure (or exposures) was. As long as the relevant exposure is included on the List, it is not necessary (and in fact may be undesirable) to include the exposure circumstance as well. The only problem will arise if the exposure circumstance includes an exposure that is not included on the List. This is only likely to occur when the causative exposure is not well characterised. In that instance, it is not desirable to include the exposure circumstance, because it is not clear what the true problem exposure is, and it is too difficult to establish that a worker has been exposed to a truly causative exposure.

Two of the exposure circumstances are specific tasks rather than general areas of work. These are painting (causally associated with bladder cancer, lung cancer and mesothelioma) and welding (causally associated with melanoma of the eye). An argument could be made that these should be included on the List, since there appears to be a more direct connection between the specific tasks and particular exposures, but for the reasons listed above, they have not been included.

Sufficient exposure

Since most occupational diseases can also be caused by non-occupational exposures, the final content of the List must be a balance between a restrictive approach and a more inclusive approach. The final decision on which diseases to include on the List is therefore based partly on the relative likelihood of a worker being exposed to the required occupational exposure circumstances. Therefore, there may be benefit in including an explicit requirement that there be “sufficient” exposure to the identified exposure in the exposure-outcome pair. Sufficient exposure in this context means exposure of sufficient duration and intensity to be reasonably capable of causing the development of the condition. Relevant non-occupational exposures would not alter this. For example, persons with sufficient occupational exposure to an agent that is known to cause lung cancer should not be precluded from being included on the List simply because they smoke (even though smoking is also known to increase the risk of developing lung cancer).

A disadvantage of including such a stipulation is the difficulty in characterising what “sufficient” is or how it would be demonstrated. This would make it more difficult for a worker whose disease has arisen from a particular exposure to make a claim, something that the Deemed Diseases approach is designed to try to minimise.

The final decision for this project, as directed by the TAG, was to not include a stipulation about sufficient exposure being required.

Latency

Most cancers and many other diseases have a lengthy period of time between first exposure to the causative agent and clinical occurrence of the disease. This period of time is called the latency. As with the concept of “sufficient exposure”, there is an argument that a List should include a stipulation about the required minimal or threshold latency to allow a claim to be made under the Deemed Diseases approach. There are difficulties with this approach, because the published quantitative information on latency is commonly weak or absent. A final decision regarding latency will be considered at a later time by the TAG. For this report, latency was not taken into account in the recommendations regarding diseases to be included on the List. However, broad information on latency has been included where relevant and possible in the guidance material.

Non-occupational exposure

Decisions about which exposure circumstances to include on the List do not take into account non-occupational exposures that a worker might have had. This might be considered when an individual claim is made under the Deemed Diseases approach, but it is not relevant to the decision regarding whether to include the disease-exposure pair on the List.

A common example of where a non-occupational exposure which might have an impact on a decision to include a disease-exposure pair is with tobacco smoking. For example, tobacco smoking is a known risk factor for lung cancer, as is asbestos exposure. It would not be appropriate to exclude smokers exposed to asbestos from being able to lodge a claim under the Deemed Disease approach, and such exclusion would be inconsistent with the principles that a working environment should be safe for the worker regardless of what the worker may do away from the workplace. Another example is chronic obstructive pulmonary disease. Tobacco smoking is the most important risk factor for the development of COPD. The overwhelming contribution of smoking to the development of COPD makes it very difficult to unambiguously assign an occupational attribution in persons who smoke, regardless of the occupational exposures that they may have. Nevertheless, excluding people who have been occupationally exposed to agents known to cause COPD simply because they have also been exposed to a non-occupational exposure that is associated with COPD is not consistent with the operation of the List, nor with the general principles of workers’ compensation. Of course, inclusion on the list does not prevent a claim being challenged on the basis of such smoking.



5

EVIDENCE USED TO
DEVELOP LIST OF
DEEMED DISEASES

5.1 INTRODUCTION

Using the criteria presented in Chapter 3, taking into account the issues considered in Chapter 4, and considering scientific evidence from the published literature, this chapter examines specific known and potential occupational diseases and their associated exposures. The chapter considers which diseases and exposures should and should not be included in a Deemed Diseases list, makes recommendations regarding these, and presents reasons for the recommendations.

5.2 INFECTIOUS DISEASES

There are some infections that are likely to usually or commonly result from work-related exposures²¹⁻²³. These are good candidates for inclusion on the List, because it is likely that any individual case would have arisen due to work-related exposures in the at-risk occupations. Leptospirosis is an example of this sort of infection. For other infections, the majority of cases will occur not in relation to occupational exposure, which means the infection is not appropriate to include for workers in general. However, for some specific working groups, most cases of the infection in question will be due to occupational exposure, so the infection in that work group could be reasonably included on the List. Tuberculosis in health care workers is a good example. Infections where there is not a strong relationship between the infectious disease and a particular occupational group, but where occupationally-related cases do occur sporadically, are not recommended for inclusion on the List.

Brucellosis

Brucellosis is a zoonotic infection caused by the *Brucella abortus* bacteria. The main occupational sources of infection are reproductive tract tissues of cattle, accidental exposures to *Brucella* vaccine, and exposure to the organism in laboratories. Brucellosis is a known risk for certain occupations, with veterinarians, farmers, abattoir workers and feral pig hunters particularly at risk²⁴⁻²⁹. It is recommended that brucellosis in high-risk workers be included on the List.

HIV/AIDS

HIV/AIDS can occur in an occupational context. The main route of occupational exposure for HIV in developed countries is percutaneous (puncturing the skin) through needle stick injuries allowing contact with contaminated body fluids. Any occupation that increases the risk of such exposure increases the risk of contracting HIV through occupational exposures. Fortunately, instances of occupationally-related HIV infections appear to be very rare, but they have occurred³⁰. Nevertheless, people at risk of contact with body fluids (e.g. health care workers, laboratory staff handling bodily fluids) are at higher risk of contracting such an infection through occupational circumstances than persons in other occupations³⁰⁻³⁴. Sexual contact is the most common form of transmission in the general population and in an occupational setting can occur in sex workers³⁵.

HIV status is usually straightforward to determine. The HIV status of an HIV positive person prior to an exposure event may not always be known but most health care workers have their HIV status determined on a regular basis. So, in most cases it should be easy to determine whether a change in status followed or preceded an exposure event.

The prevalence of HIV in the general Australian community is low and the proportion of needlestick injuries that result in someone becoming HIV positive is also low³⁰. However, an at-risk worker who becomes HIV positive following a needlestick event can reasonably be assumed to have been exposed as a result of that event. This is not the case for sex-workers, for whom HIV status will often not be known prior to an encounter with a specific client and for whom the prevalence of HIV is likely to be considerably higher than in the general public³⁵.

It is therefore recommended that HIV associated with needlestick injuries in high-risk workers (health workers and laboratory workers handling bodily fluids) be included on the List, but not HIV in other occupations.

Legionellosis

Legionellosis (also known as Legionnaire's disease) has been associated with a range of occupations (air-conditioning maintenance workers, health care personnel, ship repair workers, gardeners, construction workers, sewerage workers, automotive plant workers, and miners) in which exposure occurs to contaminated water aerosols or potting mix dust. However, the well-documented occupationally-related cases are sporadic, there are few data to indicate the incidence of occupational infection (although it appears to be uncommon) and most cases are probably not related to occupation³⁶⁻⁴¹. Therefore, legionellosis is not recommended for inclusion on the List.

Leptospirosis

Leptospirosis is a zoonotic infection caused by a range of small organisms called leptospira. The main occupational source of infection is the urine of infected animals. Persons who appear particularly at increased risk of leptospirosis include farmers (especially dairy farmers), abattoir workers, forestry workers, hunters, veterinarians, plumbers, sewer worker and transport operators⁴²⁻⁴⁴. It is recommended that leptospirosis in high-risk workers be included on the List.

Pneumococcal disease

Pneumococcal disease is a common community infection. It usually causes respiratory tract infection, mainly pneumonia in adults, but may also cause severe, widespread infection. The risk of pneumococcal disease is increased by exposure to tobacco smoke, including environmental tobacco smoke. Occupations involving significant exposure to environmental tobacco smoke, such as bar worker and restaurant worker, have an increased risk of developing pneumococcal disease. However, pneumococcal disease is very common in the community, and the increased risk due to occupation is probably relatively small. Therefore, the majority of pneumococcal infections affecting workers would probably not be related to occupation. Pneumococcal disease is not recommended for inclusion on the List.

Q fever

Q fever is a zoonotic disease caused by infection with an organism called *Coxiella burnetii*. Q fever is known to be associated with a range of occupations, primarily those involving contact with animals or animal parts in a rural setting. Occupations at highest risk in Australia appear to be abattoir workers, stock workers, stock transporters, shearers, hide processors, farmers, veterinarians and some laboratory workers⁴⁵⁻⁵³. It is recommended that Q fever in high-risk workers be included on the List.

Tuberculosis

Tuberculosis is an infection caused by *Mycobacterium* bacilli. It can affect many organs, but respiratory tuberculosis is the most common form of the disease. There is strong evidence that tuberculosis infection is a significant occupational risk for health care workers. This has been shown by good systematic studies^{54, 55} and in specific studies in Australia^{56, 57}. Other workers considered at increased risk of occupational tuberculosis infection are farmers and veterinarians (both at risk of bovine tuberculosis infection), clinical laboratory workers and funeral parlour staff^{58, 59}. It is recommended that tuberculosis in high-risk workers be included on the List.

Viral hepatitis

Viral hepatitis is an infection of the liver caused by one of a wide range of viruses. Hepatitis A (HAV) is a concern in a few selected occupations, but in an occupational context, hepatitis B (HBV) and hepatitis C (HCV) are the most important. The main routes of exposure for HBV and HCV are percutaneous through needle stick injuries, and across mucous membranes or damaged skin, through contact with contaminated body fluids. Any occupation that increases the risk of such exposure increases the risk of contracting HBV or HCV through occupational exposures.

Hepatitis A infection is commonly related to occupation in persons whose job brings them in contact with people with a higher than normal risk of having Hepatitis A—health care workers in high-risk areas, child care workers, carers of intellectually disabled persons, workers in rural or remote indigenous communities, and sewage workers^{60, 61}. It is recommended that Hepatitis A in high-risk workers be included on the List.

Hepatitis B and Hepatitis C infections are commonly related to occupation in persons whose job brings them in contact with body fluids in situations where there is a considerable risk of the worker having a break in their skin through which the infection could enter. Occupations clearly shown to be at increased risk of Hepatitis B and Hepatitis C include health care workers, persons who handle body substances, embalmers, clinical laboratory staff, workers in long-term correctional facilities, police, members of the armed forces, emergency services workers and tattooists^{33, 61-64}. It is recommended that Hepatitis B and Hepatitis C in high-risk workers be included on the List.

Hepatitis E can occur in an occupational context but is probably too uncommon in Australia to be suitable for inclusion on the List⁶⁵⁻⁶⁷.

Other infections

There are many other infections that could be contracted in an occupational context but which are very uncommon. Those that typically have an occupational origin are suitable for inclusion on the List. There are usually occupations that are strongly related to these infections and since the majority arise from occupational exposure, cases should be considered occupational unless there is a very good reason not to do so. The two specific such diseases recommended for inclusion are anthrax (strongly associated with animal handlers, abattoir workers and people working with animal hides)^{68, 69} and orf (strongly associated sheep handling)⁷⁰. Infections which are not closely connected to any specific occupation and not primarily occupational in origin are not recommended for inclusion on the List.

5.3 MALIGNANCY

General considerations

All agents identified by IARC as definite human carcinogens (IARC Group 1) and for which there is at least one cancer site for which IARC has determined there is sufficient epidemiological evidence of causation have been included in the proposed List, paired with the relevant cancer site or sites^{20, 71-78}. Agents which are classified as probable human carcinogens (IARC Group 2A) or possible human carcinogens (IARC Group 2B) have not been included. Similarly, cancer sites for which there is only limited (as defined by IARC) epidemiological evidence of a causal association with a Group 1 carcinogen have not been included. Exposure circumstances have also been excluded from the list. Mesothelioma arising from erionite exposure has been excluded because it appears this does not occur in an occupational context in Australia. The proposed cancer site-agent pairs are shown in Table 2.1.

Table 2.1 Carcinogen-cancer pairs classified by IARC as having sufficient evidence of a causal association—by cancer type

CANCER SITE/TYPE	EXPOSURE
Salivary gland	Ionizing radiation
Nasopharynx	Formaldehyde, wood dust
Oesophagus	Ionizing radiation
Stomach	Ionizing radiation
Colon and rectum	Ionizing radiation
Liver	Hepatitis B virus or Hepatitis C virus exposure related to occupation, vinyl chloride monomer
Nasal cavity and para-nasal sinuses	Ionizing radiation, leather dust, nickel, wood dust
Larynx	Acid mist—strong inorganic, asbestos*
Lung	Arsenic, asbestos, beryllium, bis(chloromethyl)ether, cadmium, chromium VI, diesel engine exhaust, environmental tobacco smoke, ionizing radiation, nickel, polycyclic aromatic hydrocarbons**, Radon-222 and its decay products, Silica dust (crystalline), Soot (chimney sweeping)
Bone	Ionizing radiation
Skin (melanoma)	Solar radiation, polychlorinated biphenyls
Skin (non-melanoma)	ionizing radiation, polycyclic aromatic hydrocarbons#, solar radiation
Mesothelioma	Asbestos
Breast (female)	Ionizing radiation
Ovary	Asbestos
Kidney	Ionizing radiation, trichloroethylene

CANCER SITE/TYPE	EXPOSURE
Bladder	2-naphthylamine, benzidine, cyclophosphamide, ionizing radiation, ortho-toluidine, polycyclic aromatic hydrocarbons [^]
Brain	ionizing radiation
Thyroid	ionizing radiation
Leukaemia ⁺	Benzene, butadiene, cyclophosphamide, formaldehyde, Hepatitis C virus exposure related to occupation, ionizing radiation
NHL	ionizing radiation

* Covers all forms of asbestos, including actinolite, amosite, anthophyllite, chrysotile, crocidolite, tremolite). Includes mineral substances that contain asbestos

** Includes exposure from coal gasification, coal tar pitch and coke production

Includes topical exposure from coal tar distillation, coal tar pitch, mineral oils (untreated or mildly treated), shale oils, soot (chimney sweeping)

[^] Exposure during aluminium production + Excluding chronic lymphatic leukaemia

Chemotherapeutic agents

Some chemotherapeutic agents are listed by IARC as definite human carcinogens. Although occupational exposure to these agents is possible, either during manufacture or use, the risk is uncertain but likely to be low because exposure is so well controlled, and the IARC decisions are primarily based on evidence from people treated with the agents rather than people exposed in an occupational context. Another complicating factor is that often the agents are associated with an increased risk of a range of different cancers, with evidence of varying strength for each agent and each cancer type, and predominantly little direct evidence of increased risk in an occupational setting.

The one clear exception to this is cyclophosphamide, for which there is sound evidence that exposure and absorption occurs in occupational settings, primarily to oncology nurses involved in administering chemotherapeutic agents, and that such exposures are associated with increased levels of DNA damage such as micronuclei and chromosome abnormalities⁷⁹⁻⁸⁷. Nurses and hospital pharmacists are the most likely persons to be exposed occupationally⁸⁸. IARC recognises an increased risk of bladder cancer and acute myeloid leukaemia⁸⁹. There are no studies which definitively identify a higher increased risk of cancer in nurses (or other occupational groups) and one recent study which modelled exposure and risk of acute myeloid leukaemia and estimated a very low increased risk based on current exposure in Dutch hospitals. However, given that exposure to cyclophosphamide is known to occur in nurses administering chemotherapeutic agents, that such exposure is associated with genetic abnormalities and that cyclophosphamide is known to be carcinogenic, it is recommended that acute myeloid leukaemia and bladder cancer in persons involved in preparing and administering cyclophosphamide for chemotherapeutic use be included on the list (i.e. oncology nurses and hospital pharmacists). It is recommended that other chemotherapeutic agents not be included on the List as an exposure linked to any cancer type.

5.4 MENTAL OR NEUROPSYCHIATRIC DISEASES

“Stress-related diseases” is used here to describe anxiety, depression, and related psychological diseases, while recognising that the nature and causes of these conditions can be very different. There are several theories about the causes of stress-related psychological diseases related to work. Most situations appear to arise when the demands of the workplace put undue psychological strain on the worker. Anxiety, depression, “stress” and related psychological diseases appear to result from this occupational strain. Many characteristics of the working environment have been associated with stress-related diseases. These include heavy workload, leadership and management style, professional conflict, excessive emotional demands of the job, and lack of job security. Virtually any occupation can have associated stress issues at some stage, and personal factors seem also to play an important role in determining whether a particular factor or factors gives rise to symptoms of stress-related diseases in an individual worker⁹⁰⁻⁹⁵. Given that anxiety, depression and stress arising from non-occupational causes are very common in the community, the difficulty characterising the causative exposures in an occupational context, and the difficulty establishing what contribution work exposures may have had on the development of any stress-related diseases, stress-related psychological diseases are not recommended for inclusion on the List.

A specific psychological disease of interest in the occupational setting is Post-Traumatic Stress Disorder (PTSD). This has overlap with the diseases just considered but is a separate condition with specific risk factors and diagnostic features. Post-Traumatic Stress Disorder appears to be more common (than in the general public) in military personnel and emergency service workers (police, ambulance officers and fire fighters) and in some areas of nursing, such as mental health nursing⁹⁶. The proportion of PTSD in these vulnerable populations that is probably due to work appears not to be well known. A recent review highlights the importance of personal factors in terms of who develops the condition and who does not despite apparently similar psychologically traumatic exposures⁹⁷. This makes the causal connection to work difficult to establish in many situations. In addition, the diagnosis is made largely on self-report of symptoms and much of the exposure measurement in relevant studies has been based on self-report. This leaves considerable room for measurement bias, making it difficult to be confident in the findings of the studies⁹⁷⁻¹⁰¹. Like anxiety and depression, there is often difficulty characterising the causative exposures, and the influence of personal psychological factors can make the work-related component, contribution or cause difficult to establish with confidence. Given the uncertainty in the risk associated with specific exposures that appear related to the risk of PTSD, issues with establishing the diagnosis, and uncertainty about the prevalence of the disorder in apparently at-risk populations, PTSD does not seem appropriate to include on the List with the current state of knowledge, and is not recommended for inclusion on the List.

There are no other mental or neuropsychiatric diseases that clearly arise from occupational exposures and are common enough in an occupational setting to warrant inclusion on the List.

5.5 NEUROLOGICAL DISEASES

Chronic solvent-induced toxic encephalopathy

Chronic solvent-induced toxic encephalopathy (or chronic solvent neurotoxicity) is a disease of the nervous system arising from exposure, usually in an occupational context, to certain organic solvents, particularly toluene, xylene, styrene, tetrachloroethylene, trichloroethylene and methylene chloride. There have been difficulties characterising the disease and developing valid and consistent diagnostic criteria, with subtle abnormalities and similar abnormalities caused by non-occupational exposures, particularly alcohol^{4, 5, 102, 103}. For these reasons, the disease is not considered suitable for inclusion on the List.

Dementia

Dementia is a progressive, degenerative disease of the brain. The two main types are Alzheimer's disease and vascular dementia. No occupational exposures have been strongly associated with the development of dementia and the disease is not recommended for inclusion on the List.

Parkinson's disease

There is good evidence that chronic manganese poisoning can cause parkinsonism (and Parkinson's disease) but the evidence is less clear as to which occupational tasks may be associated with significant enough exposure to result in the disease¹⁰⁴⁻¹⁰⁶. There is also moderate but not strong and consistent evidence that exposure to some pesticides, and work as a farmer, can increase the risk of developing Parkinson's disease¹⁰⁴⁻¹⁰⁶. A recent meta-analysis found increased risk associated with farming/agricultural occupation and ever exposure to "pesticides (or herbicides or insecticides)", and equivocal risks associated with other occupations and occupational exposures¹⁰⁷. Another recent meta-analysis did not find evidence of a relationship between either welding or occupational manganese exposure and the risk of Parkinson's disease¹⁰⁸. The evidence appears strong enough to include Parkinson's disease associated with manganese exposure on the List. However, due to the lack of strong evidence of a causal relationship between Parkinson's disease and any other specific occupational exposure, Parkinson's disease linked to any other exposure is not recommended for inclusion on the List.

Peripheral neuropathy

Peripheral neuropathy is a term that describes a group of diseases characterised by temporary or permanent damage to nerves outside the central nervous system. There are many peripheral neurotoxins (substances that result in damage to nerves) in the occupational environment. These include metals such as lead, mercury and arsenic; organic solvents such as n-hexane, carbon disulphide and trichloroethylene; pesticides such as organophosphates; and other substances such as acrylamide. There are also many non-occupational causes of peripheral neuropathy¹⁰⁹⁻¹¹⁵. (Some other peripheral neuropathies are considered in the section on upper limb diseases).

Although peripheral neuropathy can be caused by non-occupational causes, where a peripheral neuropathy occurs in a worker who has been exposed to a substance known to cause a peripheral neuropathy, it is likely that the disease will have arisen from that occupational exposure. Therefore, peripheral neuropathy and the agents known to cause it in an occupational context are recommended to be included on the List.

There are no other neurological diseases that clearly arise from occupational exposures and are common enough in an occupational setting to warrant inclusion on the List.

5.6 NOISE INDUCED HEARING LOSS

Noise-induced hearing loss is a permanent, degenerative disease of the inner ear characterised by loss of auditory acuity, particularly in the high frequency range. This particularly affects voice recognition. The cause of noise-induced hearing loss is loud noise. There is very strong evidence to show this occurs in many occupational contexts. There is some debate regarding what level of noise should be considered safe, with current evidence supporting the adoption of 85dB(A) as the level above which persistent or intermittent exposure to noise is considered likely to lead to noise-induced hearing loss¹¹⁶⁻¹²⁰. There is some evidence that a lower threshold, such as 80dB(A), should be used because minimal hearing loss appears to occur from prolonged exposure below these levels^{121, 122}. However, the evidence to support this in an occupational context is not as strong as it is for 85dB(A). Noise-induced hearing loss associated with occupational noise exposure above 85dB(A) is recommended for inclusion on the List.

5.7 CARDIOVASCULAR DISEASES

Occupational exposures have been implicated as possible causes of vascular diseases such as ischaemic heart disease and cerebrovascular disease. The strongest evidence is for carbon disulphide and nitroglycerin, both of which are now rare workplace exposures, and carbon monoxide. There is also considerable evidence regarding an association between some aspects of job organisation or control and increased risk of cardiovascular diseases, and also for an increased risk arising from exposure to environmental tobacco smoke. However, the evidence of a causal connection is equivocal, the connection between a particular exposure and a particular disease in an individual is usually unclear, and the most important known risk factors for cardiovascular disease (such as smoking, high blood pressure, high cholesterol and diabetes) are largely non-occupational in origin. There is a similar situation for hypertension, which has been particularly implicated as arising from exposure to loud occupational noise but which appears to be overwhelmingly a non-occupational condition¹²³⁻¹⁴⁴. Therefore, ischaemic heart disease, cerebrovascular disease, hypertension and related cardiovascular diseases are not recommended for inclusion on the List.

5.8 RESPIRATORY DISEASES

Chronic obstructive pulmonary disease

Chronic obstructive lung disease (COPD) is a lung disease characterised by widespread damage to the airways and gas exchange parts of the lung that cannot be reversed by treatment. Chronic bronchitis is a related disease characterised by bronchial mucous hyper-secretion. There is a significant overlap between the two diseases, and they are considered together here.

There are many work-related exposures strongly suggested to cause COPD. Much of the evidence related to occupationally-related COPD is based on combined exposures described as “vapours, gases, dusts and fumes” or a subset of these, typically without explicitly defining what these are composed of nor the circumstances in which exposure to them occurs. There is still debate as to which exposures are relevant and how much exposure is required, and there does not appear to be a definitive list of causative exposures. The most recent review reinforced this and identified the need for additional work to clarify the situation for individual and combined exposures¹⁴⁵. Tobacco smoking is the most important (non-occupational) risk factor for the development of COPD¹⁴⁵⁻¹⁵⁸.

Occupational COPD has been the subject of considerable work in recent years and it could reasonably be argued that, while there is little doubt that certain exposures increase the risk of developing COPD, the definitive evidence required in terms of identifying the relevant exposures is still lacking. This undermines the appropriateness of including COPD in a Deemed Disease List. Smoking also complicates the assessment, because of its strong association with COPD and the fact that it is responsible for a large proportion of COPD in the community. Therefore, it is recommended that COPD not be included on the List.

Asthma

Occupational asthma is probably the most common work-related respiratory disease in industrialized countries. It is a disease characterized by bronchial hyper-responsiveness or variable airflow limitation related to workplace exposures. Immunologically-mediated incident asthma should certainly be considered to be occupational asthma. Although there has been debate, incident asthma arising as result of workplace exposure to irritants, including reactive airways dysfunction syndrome (RADS) (which is a specific form of irritant-caused asthma related to acute high exposure to major irritants (such as chlorine)) should also be included. The exacerbation of pre-existing asthma by workplace irritants has also been included in the definition of occupational asthma by some authors, but this is still the subject of debate and such exacerbation of a pre-existing non-work condition does not sit well within the intended Deemed Diseases framework, which operates within a workers' compensation setting^{9, 10, 16, 159-162}. Therefore for the purposes of Deemed Diseases, the most appropriate approach seems to be to include only new cases of asthma, and to include both sensitisers and irritants.

Hundreds of occupational agents have been associated with occupational asthma. Biological agents known to cause occupational asthma include grains, flours, plants, gums, various types of wood, fur, feathers, other animal parts, insects, fungi, drugs and enzymes. Relevant chemical agents include isocyanates, metals and metal salts, chlorofluorocarbons, alcohols, and welding fumes.^{6, 7, 9, 10, 16, 163}

The diagnostic criteria for occupational asthma have been debated but these are clear enough to allow inclusion of the condition on the List⁸. Specifying on the List every agent linked to occupational asthma is impractical and any such specification is likely to become out of date as new asthma-causing agents are identified. However, a recent systematic review of relevant agents^{164, 165}, and a similar list developed for the Australian workforce¹⁶⁶, can be used as the basis of a list of specific agents linked to occupational asthma to be used on the List. There is such a clear connection between various occupational exposures and incident cases of asthma that occupational asthma should be included on the List. The associated exposures should be based on those included in the studies mentioned¹⁶⁴⁻¹⁶⁶.

Pneumoconioses

Pneumoconioses are fibrotic lung diseases caused by exposure to dusts (mainly mineral dusts) and are essentially all caused by occupational exposures. Many different dusts can cause pneumoconiosis, but the vast majority of cases are caused by exposure to silica (causing silicosis), asbestos (causing asbestosis) or coal dust (coal worker's pneumoconiosis)¹⁶⁷⁻¹⁷². All pneumoconioses should be included on the List. These specific diseases and their associated exposures should be separately included on the List. There also needs to be a general category, as suggested for asthma, to cover the many other, uncommon, forms of pneumoconiosis that can occur.

Byssinosis

Byssinosis is an asthma-like condition associated with occupational exposure to cotton, hemp, flax or sisal dust^{156, 158, 173}. Byssinosis is clearly connected with occupational and is recommended to be included on the List.

Extrinsic allergic alveolitis

Extrinsic allergic alveolitis (also known as hypersensitivity pneumonitis) is an immune-mediated disease of the alveoli (the gas-exchange spaces in the lung). The disease results from the body's immune response to repeated contact with small animal or vegetable dust particles. Mouldy hay, straw, grain or feathers are the typical causative exposures. There are a wide variety of occupational exposures associated with the development of extrinsic allergic alveolitis. It can also occur from non-occupational exposures and the symptoms can vary, making the diagnosis difficult to establish in some cases. The vast majority of occurrences of extrinsic allergic alveolitis are due to occupational exposures. Biological and non-biological agents can cause the disease and there are well documented connections to particular occupations^{159, 174-182}. Extrinsic allergic alveolitis is recommended to be included on the List.

There are no other respiratory diseases that clearly arise from occupational exposures and are common enough in an occupational setting to warrant inclusion on the List.

5.9 HEPATIC DISEASES

There are several liver diseases that may be related to occupation. Acute infections have already been considered. Other diseases include acute hepatitis not due to infection, chronic active hepatitis, and hepatic cirrhosis. Non-infective acute hepatitis in an occupational setting is most commonly due to exposure to certain hazardous substances (particularly organic solvents). Chronic active hepatitis is usually caused by infection with HBV or HCV. Cirrhosis in an occupational context primarily arises from chronic infection with either HBV or HCV, but the most common causes of cirrhosis in Australia are probably alcohol and non-occupationally-related infection with HBV or HCV^{32, 65, 183-188}.

As with occupational asthma, specifying on the List all the agents known to cause acute non-infectious hepatitis is impractical, but the disease should be included. Chronic active hepatitis, and cirrhosis, arising from chronic infection with HBV or HCV, in persons working in known high-risk occupations, are recommended to be included on the List.

There are no other hepatic diseases that clearly arise from occupational exposures and are common enough in an occupational setting to warrant inclusion on the List.

5.10 SKIN DISEASES

Irritant and allergic contact dermatitis

Irritant and allergic contact dermatitis are common diseases related to occupation. They mainly affect the hands and can arise in a wide range of occupations. As reported in the most comprehensive systematic review of the area^{13, 14}, and supported by the work of others, occupations at highest risk appear to be agricultural workers, beauticians, chemical workers, cleaners, construction workers, cooks and caterers, electronics workers, hairdressers, health care workers, machine operators, mechanics, metalworkers and vehicle assemblers. Irritant contact dermatitis in an occupational setting is most commonly reported as due to alcohols, cutting fluids, degreasers, disinfectants, petroleum products, soaps and cleaners, solvents and wet work. Allergic contact dermatitis in an occupational setting is most frequently reported as being due to chromates, cobalt, cosmetics and fragrances, epoxy resin, latex, nickel, plants, preservatives, and resins and acrylics^{13, 14, 189-196}.

Irritant and allergic contact dermatitis are recommended to be included on the List but, as with occupational asthma, the large number of occupational agents that have been shown to cause occupational dermatitis means that individually listing the agents is impractical.

Vitiligo

Vitiligo is an uncommon skin disease in which the melanin-producing cells in the skin, mucous membranes and/or eye are affected, with loss of pigment resulting in white patches on the skin or other affected areas. Most cases are non-occupational in origin, but there are several specific occupational exposures (para-tertiary-butylphenol; para-tertiary-butylcatechol; para-amyphenol; hydroquinone or the monobenzyl or monobutyl ether of hydroquinone) directly linked to the development of vitiligo (which is then known as occupational vitiligo)¹⁹⁷⁻²⁰².

Vitiligo associated with these specific exposures is recommended to be included on the List.

There are no other skin diseases that clearly arise from occupational exposures and are common enough in an occupational setting to warrant inclusion on the List.

5.11 MUSCULOSKELETAL DISEASES

Introduction to upper limb diseases

There is a range of upper limb musculoskeletal diseases associated with work. Some have clear clinical and pathological diagnostic criteria. These include rotator cuff syndrome, lateral epicondylitis, medial epicondylitis, ulna nerve entrapment, radial nerve entrapment, tendonitis in the hand and fingers, Raynaud's disease (peripheral neuropathy related to upper limb vibration, also known as vibration white finger), De Quervain's tenosynovitis and carpal tunnel syndrome²⁰³⁻²¹¹.

In addition, there are many cases of upper limb pain without associated objective signs. These cases have been given many labels, including repetitive strain injury, occupational overuse syndrome and non-specific musculoskeletal disease of the upper limb^{11, 209, 212-216}.

A wide range of occupations, tasks and workplace organisational and psychosocial factors have been associated with one or more of these upper limb diseases and syndromes. These include the use of hand tools; working with raised arms; vibration; the combination of repetition, force and posture; and low job control, low social support, perceived monotonous work and other causes of job "strain". Some particular upper limb diseases have been associated with specific workplace postures or exposures^{11, 12, 203-211, 213, 214, 217-243}.

Identifying a particular person as having an occupationally-related upper limb disease is complicated by several factors. There is a lack of agreement concerning diagnostic criteria for many diseases; a lack of agreement over the likely causative exposures, both in general and in specific cases; and many non-occupational exposures that can result in the diseases^{11, 12, 209, 237, 238}. All these factors need to be taken into account when making a final decision on which diseases should be included on the List. Those to be included should have agreed diagnostic criteria and occupational exposures that are well characterised and for which there is strong evidence. Workplace organisational factors are too difficult to define and measure to allow these to be included on the List as one of the causative exposures.

In summary, it appears likely that for some of the musculoskeletal diseases considered in this section there are specific occupational exposures that may truly increase the risk of developing the disease. However, the frequency, exact nature and forcefulness of the required exposures are not able to be characterised well enough, and are not consistent enough in specific occupations, to allow their inclusion on a Deemed Disease List.

Rotator cuff syndrome

Rotator cuff syndrome is characterised by pain, often associated with decreased function, of the shoulder due to inflammation or tear of one or more tendons that comprise the rotator cuff of the shoulder²¹².

Individual studies have suggested potential occupational causes of rotator cuff syndrome such as repeated or prolonged working above the shoulder²⁴⁴⁻²⁴⁶, repeated arm abduction²⁴⁷ and some psychological workplace factors^{244, 245, 247}, but the only systematic reviews considering work-related exposures and disorders of the shoulder did not identify any useable published studies that focussed on rotator cuff syndrome^{203, 216, 248}. The main non-occupational causes of rotator cuff syndrome appear to be "...overloading, instability of the glenohumeral and acromioclavicular joint, muscle imbalance due to adverse anatomical features, cuff degeneration with ageing, ischaemia and musculoskeletal diseases resulting in wasting of the cuff muscles"²²⁷.

There are several consensus documents or systematic reviews that proposed criteria for diagnosis of rotator cuff syndrome and there is enough consistency between them to accept that the diagnosis of rotator cuff syndrome can be made with accuracy^{209, 212, 215, 216}.

Rotator cuff syndrome is one of the most common specific shoulder pathologies in the community, with a prevalence around 5% to 6%²⁴⁹. Proportionately, non-specific shoulder pain is more common than rotator cuff syndrome in the working community than it is in the general community²²⁷.

It is recommended that rotator cuff syndrome not be included on the List, primarily because the frequency, exact nature and forcefulness of the required exposures are not able to be characterised well enough, and are not consistent enough in specific occupations. These issues are exacerbated by the high prevalence of rotator cuff syndrome in the community.

Lateral and medial epicondylitis

Lateral and medial epicondylitis are characterised by pain and tenderness at the site of attachment of some forearm muscles to the outside (lateral) or inside (medial) aspects of the lower humerus (the epicondyles)²¹².

There are three relevant systematic reviews. Epicondylitis is associated with activities requiring high force, particularly if repetitive or involving awkward postures, or involving the use of vibrating tools. Evidence for awkward postures alone, or repetitive activities alone, is less convincing. However, the evidence for all these risk factors is inconsistent and the exposure definitions varied considerably between studies. Several studies have found a higher risk of epicondylitis in meat workers (meat cutters and sausage makers) but the evidence as to whether there truly is a higher risk in specific occupations is weak due to poor control of potential selection and measurement bias and confounding (most of the studies were cross-sectional in design and used exposures

based on self-report). There is limited information on the potential role of psychological factors and what information is available is inconsistent and comes from studies with apparent significant methodological problems^{204, 207, 231}.

Epicondylitis is more common in persons aged 40 to 60 and more common in women than men²⁰⁷.

The diagnosis of lateral and medial epicondylitis is usually straightforward. There are several consensus documents or systematic reviews that proposed similar diagnostic criteria^{209, 212, 215, 216}.

Both lateral and medial epicondylitis probably occur in about 1% of the adult population^{204, 249} but the prevalence appears much higher in various occupation groups associated with exposure to some of the identified probable risk factors²⁰⁷.

It is recommended that epicondylitis (both lateral and medial) not be included on the List, primarily because the frequency, exact nature and forcefulness of the required exposures are not able to characterised well enough, and are not consistent enough in specific occupations.

Radial nerve entrapment and ulna nerve entrapment

The ulna nerve and the radial nerve can be damaged by direct pressure as they pass adjacent to bony structures around the elbow²³⁴. The one relevant systematic review found that ulna nerve entrapment (so-called 'cubital fossa syndrome') was associated with 'holding a tool in position'²⁰⁴, although this was based on the findings of a single study²⁵⁰. Two other single studies not included in the systematic review suggested increased risk resulting from repetitive work with flexed elbows, especially in floor cleaners^{233, 243}. Handling loads weighing more than one kilogram and static postures of the elbow were associated with radial nerve entrapment²⁰⁴, but again based only on a single study²⁵¹.

The diagnosis of ulna nerve entrapment and radial nerve entrapment is usually straightforward. There are several consensus documents or systematic reviews that proposed similar diagnostic criteria^{209, 212, 215, 216}.

The population prevalence of ulna nerve entrapment and radial nerve entrapment is not known. Ulna nerve entrapment has been reported to occur in between 3% to 7% of workers²⁰⁴. Radial nerve entrapment was reported by the same authors to have a much smaller but unknown prevalence.

It is recommended that ulna nerve entrapment and radial nerve entrapment not be included on the List, primarily because the frequency, exact nature and forcefulness of the required exposures are not able to characterised well enough, and are not consistent enough, in specific occupations.

De Quervain's disease

De Quervain's disease involves pathology of or around the tendon sheaths at the base of the thumb^{209, 212, 215, 216}.

One systematic review considered the role of occupational exposures with de Quervain's disease. This review found a significant association between "repetitive, forceful or ergonomically stressful manual work" and de Quervain's disease in the included studies, but the authors concluded that overall there was insufficient evidence of a causal relationship between any specific occupational exposure and the occurrence of the de Quervain's disease. They also did not identify any occupational groups for which there was strong evidence of a causal relationship with de Quervain's disease²⁰⁸.

Consensus diagnostic criteria for de Quervain's disease have been developed^{209, 215} and although these are centred on the Finkelstein test, which was been noted in some studies to have very low specificity (and high sensitivity)²⁵², these criteria appear to be able to be applied reasonably consistently.

There is little reliable information on the prevalence of de Quervain's disease in the general or working populations. One large study in the United Kingdom suggested a population prevalence of about 1%²⁴⁹.

It is recommended that de Quervain's disease not be included on the List, primarily because the frequency, exact nature and forcefulness of the required exposures are not able to characterised well enough, and are not consistent enough in specific occupations. These issues are exacerbated by the low and uncertain prevalence in both the community and in workers.

Carpal tunnel syndrome

Carpal tunnel syndrome is a common condition in the general community, with a prevalence of the order of 6% to 11% in working populations and 8% in the general population^{211, 221}. Particularly high rates have been found in workers employed in meat and fish processing, in forestry work with chain saws and in electronic assembly²¹¹. However, there is insufficient information to allow confident summary estimates of prevalence or incidence in specific work-groups²²¹.

There is good evidence from several systematic reviews of occupational exposures that repetition, vibration, use of high hand force and prolonged flexion or extension of the wrist can increase the risk of developing carpal tunnel syndrome, with associated relative risks being two or more^{210, 211, 218, 221, 225, 232}. Personal risk factors such as age, sex, being overweight and diabetes are also important^{205, 222, 235, 236}.

The association with keyboard use is unclear, with several studies identifying suggestive adverse effects of various keyboard operator activities but others having contradictory findings. Assessment is hampered because of methodological differences between the studies and methodological shortcomings^{210, 211, 217, 219}.

Several factors make it difficult to include carpal tunnel syndrome on the List. The case definition and diagnostic criteria vary^{211, 225, 232, 253}. The occupational exposures for which there is good evidence of a causal relationship with carpal tunnel syndrome can be difficult to measure objectively²¹⁰ and the intensity and duration necessary to meaningfully increase the risk of carpal tunnel syndrome are not well characterised. Finally, carpal tunnel syndrome is a common condition in the general community.

Therefore, it is recommended that carpal tunnel syndrome not be included on the List.

Occupational overuse syndrome

Occupational overuse syndrome has uncertain diagnostic criteria^{209, 212, 215, 216}, uncertain risk factors, and uncertain community and workplace prevalence^{11, 213, 229, 231, 237}. Therefore, it is recommended that occupational overuse syndrome is not included on the List.

Forearm, hand and finger tendonitis and non-specific forearm pain

There are a range of other conditions involving the forearm, hand and fingers, many of which probably involve tendonitis, which have been implicated as being related to work. However, the diagnostic criteria are not well established^{209, 212, 215, 216}, the causative exposures for these are not well characterised, and the general and workplace prevalence uncertain^{11, 213, 229, 231, 237}. Therefore, it is recommended that forearm, hand and finger tendonitis and non-specific forearm pain are not included on the List.

Raynaud's disease

Raynaud's disease is discussed in Section 5.12.

Bursitis

Bursitis is inflammation of a bursa, a small sac designed to decrease friction between muscles, tendons, bones and skin during movement²³⁰. Any form of repetitive motion or persistent physical pressure can cause bursitis. Most bursae can become inflamed in the course of work when these exposures are involved, but the two most commonly involved are at the elbow (olecranon bursitis) and at the knee (pre-patellar bursitis and infra-patellar bursitis). A direct connection to work should be demonstrable in most occupational cases involving the elbow or knee because of the close association with repetitive motion or persistent physical pressure. Occupational bursitis involving other bursae is possible, but likely to be much less common and harder to directly and confidently connect to occupational factors^{230, 254}. Therefore, olecranon bursitis, pre-patellar bursitis and infra-patellar bursitis are recommended for inclusion on the List, linked to the relevant causative exposures for which there is strong evidence. It is recommended that the other types of bursitis are not included on the list due to their rarity and the lack of strong evidence linking them to specific occupational exposures.

Low back pain

Low back pain is a very common musculoskeletal disease both in an occupational setting and in the general community. Chronic low back pain, in particular, is a major cause of disability and cost related to work²⁵⁵ and in general²⁵⁶. The connection between low back pain symptoms, disability and demonstrable pathology is often not clear or requires very focused investigation. A wide range of occupations, work tasks, workplace factors and psychological factors have been associated with low back pain, but there is significant debate regarding the validity of much of the evidence^{220, 257, 258}. For this reason, and because the condition is also very commonly associated with non-occupational factors, low back pain is not suitable for inclusion on the List and it is recommended it not be included.

Osteoarthritis

Osteoarthritis is a chronic degenerative disease of joints characterized by damage to, and loss of, articular cartilage. It is very common in the general community. There appear also to be many occupational causes, although the evidence for any specific exposure is not strong²⁵⁹⁻²⁶¹. For this reason, and because the condition is also very commonly associated with non-occupational factors, osteoarthritis is not suitable for inclusion on the List and it is recommended it not be included.

Scleroderma

Scleroderma (also known as progressive systemic sclerosis) is a rare autoimmune disease involving the connective tissue. A variety of occupational exposures have been linked to scleroderma, with the evidence strongest, but not definite, for silica^{262, 263}. Since the disease is rare and the evidence about occupational causation not strong, it is recommended that scleroderma not be included on the List.

5.12 VIBRATION DISEASES

Vibration has been associated with lower back pain and several upper limb pain diseases, including secondary Raynaud's disease (vibration white finger), carpal tunnel syndrome and scleroderma. The strongest relationship is with secondary Raynaud's disease. Common causes of increased levels of hand-transmitted vibration are hammer drills, hand-held portable grinders and jigsaws^{205, 206, 210, 262-265}. Raynaud's disease associated with vibration is recommended for inclusion on the List. Other vibration-associated diseases are recommended to be excluded from the List because of difficulties with consistent diagnosis and the common association with non-occupational exposures.

5.13 DISEASES OF THE GENITOURINARY SYSTEM

Renal failure (acute and chronic) is primarily due to non-occupational exposures. The strongest connection between occupational exposures and renal failure is with metals such as lead, cadmium, chromium and mercury, including via welding fumes²⁶⁶⁻²⁷². This satisfies the first criterion of strength of evidence. However, even in people with these exposures, non-occupational factors such as hypertension and diabetes are likely to be responsible for the vast majority of cases. Therefore, renal failure can be considered not to meet Criterion 3. It is recommended that renal failure be excluded from the List.

There are no other genitorurinary system diseases that clearly arise from occupational exposures and are common enough in an occupational setting to warrant inclusion on the List.

5.14 REPRODUCTIVE RISKS

Reproductive diseases cover problems with fertility and congenital abnormalities. Both males and females can be affected. Reproductive diseases have a wide range of causes, and in the majority of cases the cause is not known. The application of diagnostic criteria for many reproductive diseases can also be difficult. Occupational exposures and occupations that have been strongly implicated in adversely affecting reproduction in both males and females are lead, mercury, multiple chemical and pesticide exposures, organic solvents (particularly carbon disulphide and 2-bromopropane), and ionising radiation. Other exposures implicated as being of concern specifically to females include ethylene glycol, toluene and shift work. Exposures implicated as being of concern specifically to males include the pesticides 1,2-dibromo-3-chloro-propane (DBCP), carbaryl and 2,4-dichloro phenoxy acetic acid (2-4 D); chromium; heat; microwave radiation; ethylene dibromide; and styrene²⁷³⁻²⁷⁸.

Reproductive diseases are so common in the general community, and so difficult to consistently diagnose, that in any individual case it is usually very difficult to determine the extent of the problem, and to determine if an occupational exposure has made a meaningful contribution to the problem. Therefore, these diseases are not suitable for inclusion on the List and it is recommended that they not be included.

5.15 ACUTE CHEMICAL POISONING / TOXICITY

There are a range of diseases characterised by systemic abnormalities of metabolic processes due to contact with one or more industrial chemicals (“work-related acute and chronic poisoning”). Most commonly the respiratory, nervous or cardiovascular systems are affected, but the problems may affect any body system. The chronic problems are covered by other diseases considered for the List. This section covers short term chemical-related problems and the exposures leading to them, as well as systemic problems arising from exposure to metals^{110, 279-284}.

There are a wide range of workplace chemicals that can cause abnormalities in metabolic processes. As with occupational asthma, it is virtually impossible to ensure that every possible relevant agent is explicitly included. The revised ILO list specifies a number of them. It is recommended that all those agents explicitly included in ILO Recommendation 194 be included on the List. In addition, organophosphate pesticides^{285, 286}, organochlorine pesticides²⁸⁶ and related compounds²⁸¹, formaldehyde, toluene, xylene and methylene chloride should be explicitly included.

5.16 MULTIPLE CHEMICAL SENSITIVITY

Multiple chemical sensitivity is a syndrome characterised by an abnormal, multi-organ sensitivity following chemical exposures. There is lack of agreement as to what the underlying pathological mechanisms are and whether multiple chemical sensitivity should be viewed as a separate clinical entity. There are diagnostic criteria that are generally accepted, but difficult to apply. There are no occupational exposures clearly related to the development of multiple chemical sensitivity and for which there is strong evidence²⁸⁷⁻²⁹⁰. It is recommended that multiple chemical sensitivity not be included on the List.



6 RECOMMENDED AUSTRALIAN SPECIFIC LIST OF DEEMED DISEASES

6.1 RECOMMENDED CONTENT OF DEEMED DISEASE LIST

This chapter contains the diseases and associated exposures (or occupations) recommended for inclusion on the Deemed Diseases List, based on the considerations in Chapter 4 and the information presented in Chapter 5 (Table 6.1). The list is ordered in the same way as the information presented in Chapter 5, which largely follows the order of ICD-10.

Table 6.1 Recommended content of Deemed Disease List

DISEASE	EXPOSURE OR OCCUPATION
INFECTIOUS DISEASE	
Anthrax	Relevant occupations involving work with animals or animal carcasses (such as animal handler, pelt handler, abattoir worker, meat inspector).
Brucellosis	Relevant occupations involving work with animals or animal carcasses (such as veterinarian, farmer or farm worker, abattoir worker, laboratory worker).
Hepatitis A	Relevant occupations involving contact with human waste (such as child care workers, carers of intellectually disabled persons, workers in rural or remote indigenous communities, and sewage workers and plumbers).
Hepatitis B and C	Relevant occupations involving contact with human bodily secretions (such as health care worker, embalmer, person who handles body substances, clinical laboratory staff, worker in long-term correctional facilities, police, member of the armed forces, emergency services worker).
HIV/AIDS	Health care workers and laboratory workers who become HIV positive after a needlestick injury.
Leptospirosis	Relevant occupations involving work with animals or animal carcasses (such as farmer or farm worker, abattoir worker, forestry worker, hunter, veterinarian, livestock transport operator) or work with animal or human waste (such as plumber).
Orf	Relevant occupations involving work with sheep or sheep carcasses (such as sheep farmer or farm worker, goat farmer or farm worker, abattoir worker, meat inspector).
Q-fever	Relevant occupations involving contact with animals or animal parts in a rural setting (such as abattoir workers, stock workers, stock transporters, shearers, hide processors, farmers and veterinarians).
Tuberculosis	Relevant occupations involving contact with persons or animals in situations where tuberculosis prevalence is likely to be significantly higher than the general community (such as health worker, clinical laboratory worker, funeral parlour staff, farmer, veterinarian), or person with silicosis.

DISEASE	EXPOSURE OR OCCUPATION
MALIGNANCY	
Salivary gland	Ionizing radiation
Nasopharynx	Formaldehyde, wood dust
Oesophagus	Ionizing radiation
Stomach	Ionizing radiation
Colon and rectum	Ionizing radiation
Liver	HBV or HCV exposure related to occupation, vinyl chloride monomer
Nasal cavity and para-nasal sinuses	Ionizing radiation, leather dust, nickel, wood dust
Larynx	Acid mist—strong inorganic, asbestos*
Lung	Arsenic, asbestos, beryllium, bis(chloromethyl)ether, cadmium, chromium VI, diesel engine exhaust, ETS, ionizing radiation, nickel, PAHs**, Radon-222 and its decay products, Silica dust (crystalline), Soot (chimney sweeping)
Bone	Ionizing radiation
Skin (melanoma)	Solar radiation, polychlorinated biphenyls
Skin (non-melanoma)	ionizing radiation, polycyclic aromatic hydrocarbons#, solar radiation
Mesothelioma	Asbestos
Breast (female)	Ionizing radiation
Ovary	Asbestos
Kidney	Ionizing radiation, trichloroethylene
Bladder	2-naphthylamine, benzidine, cyclophosphamide, ionizing radiation, ortho-toluidine, polycyclic aromatic hydrocarbons^
Brain	Ionizing radiation
Thyroid	Ionizing radiation
Leukaemia ⁺	Benzene, butadiene, Cyclophosphamide, formaldehyde, HCV exposure related to occupation, ionizing radiation
NHL	Ionizing radiation

*: Covers all forms of asbestos, including actinolite, amosite, anthophyllite, chrysotile, crocidolite, tremolite). Includes mineral substances that contain asbestos.

** : Includes exposure from coal gasification, coal tar pitch and coke production

: Includes topical exposure from coal tar distillation, coal tar pitch, mineral oils (untreated or mildly treated), shale oils, soot (chimney sweeping)

^ : Exposure during aluminium production

+ : Excluding chronic lymphatic leukaemia

DISEASE	EXPOSURE OR OCCUPATION
DISEASES OF THE NERVOUS SYSTEM	
Parkinson's disease	Manganese
Peripheral neuropathy	Metals such as lead, mercury and arsenic; organic solvents such as n-hexane, carbon disulphide and trichloroethylene; pesticides such as organophosphates; acrylamide.
Noise induced hearing loss	Exposure to persistent or intermittent noise above 85db(a)
RESPIRATORY DISEASES	
Occupational asthma ^{&}	Sensitising agents or irritants—arthropods or mites, biological enzymes, bioaerosols, derived from fish/shellfish, derived from animals, flour, sensitising foods, flowers, latex, wood dusts, soldering, reactive dyes, anhydrides, acrylates, epoxy, ethylene oxide, aldehydes, pesticides, amines, ammonia, industrial cleaning agents, acids, isocyanates, other reactive chemicals, sensitising metals, sensitising drugs.*
Coal workers' pneumoconiosis	Coal
Asbestosis	Asbestos
Silicosis	Silica
Other pneumoconiosis	Exposures known to occasionally cause pneumoconiosis, such as beryllium, tin, iron oxide, barium, aluminium, cobalt, tungsten ²
Byssinosis	Cotton, flax, hemp, sisal dust
Extrinsic allergic alveolitis	Damp material of biological origin, such as mouldy hay, straw, grain and feathers
HEPATIC DISEASES	
Non-infectious hepatitis	Agents known to cause hepatitis (particularly organic solvents) ⁺
Chronic active hepatitis	Persons with known HBV or HCV related to occupation
Hepatic cirrhosis	Persons with known HBV or HCV related to occupation

*: The large number of occupational agents that have been shown to cause these diseases means that it is impractical to list every relevant agent

&: This includes immunologically-mediated occupational asthma and new cases of occupational asthma arising as result of workplace exposure to irritants. It excludes pre-existing asthma worsened due to exposure to workplace irritants.

+: See the entry under "Acute poisoning / toxicity" for a detailed list of specific exposures.

DISEASE	EXPOSURE OR OCCUPATION
SKIN DISEASES	
Contact dermatitis (irritant and allergic)	Sensitising agents or irritants—Irritant contact dermatitis in an occupational setting is most commonly reported as due to alcohols, cutting fluids, degreasers, disinfectants, petroleum products, soaps and cleaners, solvents and wet work. Allergic contact dermatitis in an occupational setting is most frequently reported as being due to chromates, cobalt, cosmetics and fragrances, epoxy resin, latex, nickel, plants, preservatives, resins and acrylics.*
Occupational vitiligo	Para-tertiary-butylphenol; para-tertiary-butylcatechol; para-amyphenol; hydroquinone or the monobenzyl or monobutyl ether of hydroquinone.
MUSCULOSKELETAL DISEASES	
Raynaud's disease	Vibration from powered tools and equipment
Bursitis (at the elbow or knee)	Prolonged external friction or pressure or repetitive motion at or about the elbow or the knee
ACUTE POISONING/TOXICITY	
Acute poisoning / toxicity (includes acute damage to the heart, lungs, liver, kidney, nervous system and blood)	Acrylonitrile; alcohols; antimony; arsenic; benzene; beryllium; cadmium; carbon disulphide; chromium; copper; fluorine; alcohol, glycols or ketones; hexane; lead; manganese; mercury; mineral acids; nitroglycerine (or other nitric acid esters); osmium; oxides of nitrogen; ozone; pesticides (organophosphate and organochlorine compounds, herbicides and related compounds; pharmaceutical agents; phosgene; phosphorus; selenium; styrene; thallium; tin; toluene; vanadium; zinc; chemical asphyxiants (carbon monoxide, hydrogen cyanide, hydrogen sulphide, methylene chloride); irritants (benzoquinone and other corneal irritants); toxic halogen derivatives of aliphatic or aromatic hydrocarbons; toxic nitro- and amino-derivatives of benzene (and other less common, specific substances not included here) ²

*: The large number of occupational agents that have been shown to cause these diseases means that it is impractical to list every relevant agent

6.2 DISEASES NOT RECOMMENDED FOR INCLUSION ON THE PROPOSED DEEMED DISEASE LIST

Not all diseases possibly linked to an occupational exposure were considered earlier in this report, as that would have been impractical. Those diseases that were considered but which are not recommended for inclusion on the List are presented here, along with the reasons for their exclusion, based on the three project criteria (Table 6.2). Note that a disease not being recommended for inclusion on the List does NOT imply that it should not be compensated. A claim through the usual workers' compensation system can still be made if the disease is included under the current legislation of the relevant jurisdiction.

Table 6.2 Diseases recommended not to be included on the List, with justification against the project criteria

DISEASE	CRITERIA NOT MET BY DISEASE*
INFECTIOUS DISEASE	
Legionellosis	Criterion 3
Pneumococcal disease	Criteria 1 and 3
Malignancy	Decision based only on IARC classification and evidence regarding connection with a specific disease and a specific exposure.
Exposure circumstances [#]	Criterion 1
Chemotherapeutic agents (except cyclophosphamide)	Criterion 1
Stress-related psychological disease (including PTSD)	Criteria 1, 2 and 3
DISEASES OF THE NERVOUS SYSTEM	
Chronic solvent-induced toxic encephalopathy	Criteria 1 and 2
Dementia	Criteria 1 and 3
VASCULAR DISEASES	
Ischaemic heart disease	Criteria 1 and 3
MUSCULOSKELETAL DISEASES	
Rotator cuff syndrome	Criteria 1 and 3
Epicondylitis	Criterion 1
Ulna nerve entrapment	Criterion 1 and 3
Radial nerve entrapment	Criterion 1 and 3
De Quervain's disease	Criteria 1 and 3
Carpal tunnel syndrome	Criteria 2 and 3
Occupational overuse syndrome	Criteria 1 and 2

DISEASE	CRITERIA NOT MET BY DISEASE*
Forearm, hand and finger tendonitis and non-specific forearm pain	Criteria 1, 2 and 3
Low back pain	Criteria 2 and 3
Osteoarthritis	Criteria 1 and 3
Scleroderma	Criteria 1 and 3
Vibration diseases (except Raynaud's)	Criteria 1, 2 and 3
Chronic renal failure	Criterion 3
Reproductive diseases	Criteria 2 and 3
Multiple chemical sensitivity	Criteria 1, 2 and 3

*: The criteria are as follows

- 1) There is strong evidence of causal link between the occupational exposure and the disease;
- 2) There are clear and repeatable criteria for diagnosing the disease; and
- 3) The disease comprises a considerable proportion of the cases of that disease in the overall population or in an identifiable subset of the population.

#: The excluded exposures and exposure circumstances are shown below.

CANCER SITE/TYPE	EXPOSURE
Stomach	Rubber production
Nasal cavity and para-nasal sinuses	Isopropyl alcohol production using strong acids
Lung	Aluminium production
Lung	hematite mining (underground)
Lung	Iron and steel founding
Lung	Painting
Lung	Rubber production
Mesothelioma	Erionite
Mesothelioma (pleural)	Painting
Eye (melanoma)	Welding
Bladder	Auramine production
Bladder	Magenta production
Bladder	Painting
Bladder	Rubber production
Leukaemia	Rubber production
NHL	Rubber production



7 RECOMMENDED GUIDANCE MATERIAL

7.1 INTRODUCTION

One aspect of the project was to develop some brief guidance material on each disease included on the List. This information could sit separately to the List and be used by potential claimants and claims officers when deciding whether or not a claim might be appropriate given the current knowledge about the disease and its relationship to relevant exposures.

The Technical Advisory Group requested that the guidance material include that included:

- a short description of the disease, and relevant information on
- relevant occupation or industry
- latency period
- minimum exposure
- any non-occupational causes.

Providing the information on latency and on minimum exposure raised problems because a lack of information in the literature to allow any precise guidance to be presented in nearly all instances. An attempt has been made to provide information on latency, but only in broad terms. This information covers both the minimum latency and the average latency, where possible. Information on minimum exposure is not presented as it proved impractical to provide such a guidance beyond very qualitative descriptions such as “non-trivial” or “sufficient” exposure, because of the difficulty in characterising what “sufficient” is or how it would be demonstrated, as considered earlier in Chapter 4.

The content of the guidance material is based on the literature review presented in Chapter 5, supplemented by information from additional sources, particularly CAREX Canada²⁹¹ for information on carcinogens.

7.2 GUIDANCE MATERIAL

Infectious diseases

BRUCELLOSIS

Description	Generalised infective illness that usually arises from contact with reproductive tract tissues of infected cattle.
Exposure	<i>Brucella</i> sp.
High risk occupation or industry	Veterinarians, farmers, abattoir workers and feral pig hunters.
Latency period	One to two weeks.
Main external non-occupational risk factors	Non-occupational exposure uncommon.

HEPATITIS A

Description	Viral infection that affects the liver and is spread between people from hand to mouth.
Exposure	Hepatitis A virus
High risk occupation or industry	People whose job brings them in contact with persons who may have Hepatitis A, such as health care workers in high-risk areas, child care workers, carers of intellectually disabled persons, workers in rural or remote indigenous communities, sewage workers and plumbers.
Latency period	One to three weeks.
Main external non-occupational risk factors	Not common in the general Australian community.

HEPATITIS B AND C

Description	Viral infection that affects the liver and is spread between people through contact with body fluids.
Exposure	Hepatitis B and C virus
High risk occupation or industry	People whose job brings them in contact with body fluids in situations where there is a considerable risk of the worker having a break in their skin through which the infection could enter, such as health care workers, persons who handle body substances, embalmers, clinical laboratory staff, workers in long-term correctional facilities, police, members of the armed forces, emergency services workers and tattooists
Latency period	One to three weeks.
Main external non-occupational risk factors	A considerable minority of Australian persons are carriers and potentially infectious.

HIV/AIDS

Description	Immunodeficiency illness due to infection with the HIV. There may be no symptoms for much of the time the person is HIV positive.
High risk occupation or industry	Health care workers and laboratory workers handling bodily fluids. Only known occupational transmission in these occupations is through needlestick injury.
Latency period	Two weeks to six weeks.
Main external non-occupational risk factors	Sexual transmission.

LEPTOSPIROSIS

Description	Generalised infective illness that usually arises from contact with urine of infected small animals (particularly rats), typically in a rural setting.
Exposure	Leptospira sp.
High risk occupation or industry	Farmers (especially dairy farmers), abattoir workers, forestry workers, hunters, veterinarians, plumbers and sewer worker.
Latency period	One to two weeks.
Main external non-occupational risk factors	Non-occupational exposure uncommon.

Q-FEVER

Description	Generalised infective illness that usually arises from contact with infected animals or animal parts, usually in a rural setting.
Exposure	Coxiella burnetii
High risk occupation or industry	Abattoir workers, stock workers, stock transporters, shearers, hide processors, farmers and veterinarians.
Latency period	One to two weeks.
Main external non-occupational risk factors	Non-occupational exposure uncommon.

TUBERCULOSIS

Description	Infection that usually affects the lungs and can be spread between persons or from animals to persons.
Exposure	Mycobacterium tuberculosis
High risk occupation or industry	Health workers, farmers and veterinarians, clinical laboratory workers and funeral parlour staff.
Latency period	Weeks to months.
Main external non-occupational risk factors	Unusual infection in Australian-born persons unless they come from very low socio-economic circumstances or have very poor health.

ANTHRAX

Description	Very rare infective illness that usually causes open sores on the skin (although involvement of the lung is commonly fatal) and typically arises from contact with the hide of rural animals.
Exposure	Bacillus anthracis
High risk occupation or industry	Animal handlers, abattoir workers and people working with animal hides.
Latency period	Weeks to months.
Main external non-occupational risk factors	Non-occupational exposure very rare.

ORF

Description	Rare infective illness that usually causes pustules on the skin and typically arises from contact with infected sheep.
Exposure	Parapox virus
High risk occupation or industry	Sheep farmers.
Latency period	Weeks to months.
Main external non-occupational risk factors	Non-occupational exposure very rare.

Malignancies

SALIVARY GLAND CANCER

Description	Malignant disease of the salivary glands.
Exposure	Ionizing radiation.
High risk occupation or industry	Ionizing radiation would be expected to be very well controlled in Australia but is relevant for anyone whose occupation potentially exposes them to x-rays on a regular basis, which can occur in a range of settings—health (radiographers, radiologists, radiotherapists, dentists), manufacturing and industry (various specific jobs), security (customs officers), nuclear industry (work with isotopes).
Latency period	Minimum five years; commonly at least 15 to 20 years.
Main external non-occupational risk factors	Smoking and alcohol.

NASOPHARYNGEAL CANCER

Description	Malignant disease of the nasopharynx
Exposure	Formaldehyde, wood dust
High risk occupation or industry	<p>Formaldehyde exposure is most likely in embalmers, forensic/hospital mortuary workers, pathology laboratory workers, formaldehyde resin manufacturers, users and packers.</p> <p>Wood dust exposure is most likely in workers involved in wood processing (workers in pulp and paper mills, sawmills, veneer and plywood plants, woodchip operations), people who use wood (joineries, furniture manufacturing, other timber product manufacturing, carpentry, roofing, flooring, maintenance work) and people who otherwise work with wood (tree-loppers and chainsaw operators)</p>
Latency period	Minimum five years; commonly at least 15 to 20 years.
Main external non-occupational risk factors	Smoking and alcohol.

OESOPHAGEAL CANCER

Description	Malignant disease of the oesophagus.
Exposure	Ionizing radiation.
High risk occupation or industry	Ionizing radiation would be expected to be very well controlled in Australia but is relevant for anyone whose occupation potentially exposes them to x-rays on a regular basis, which can occur in a range of settings—health (radiographers, radiologists, radiotherapists, dentists), manufacturing and industry (various specific jobs), security (customs officers), nuclear industry (work with isotopes).
Latency period	Minimum five years; commonly at least 15 to 20 years.
Main external non-occupational risk factors	Smoking and alcohol.

STOMACH CANCER

Description	Malignant disease of the stomach
Exposure	Ionizing radiation
High risk occupation or industry	Ionizing radiation would be expected to be very well controlled in Australia but is relevant for anyone whose occupation potentially exposes them to x-rays on a regular basis, which can occur in a range of settings—health (radiographers, radiologists, radiotherapists, dentists), manufacturing and industry (various specific jobs), security (customs officers), nuclear industry (work with isotopes)
Latency period	Minimum five years; commonly at least 15 to 20 years.
Main external non-occupational risk factors	Smoking.

COLO-RECTAL CANCER

Description	Malignant disease of the colon or rectum
Exposure	Ionizing radiation
High risk occupation or industry	Ionizing radiation would be expected to be very well controlled in Australia but is relevant for anyone whose occupation potentially exposes them to x-rays on a regular basis, which can occur in a range of settings—health (radiographers, radiologists, radiotherapists, dentists), manufacturing and industry (various specific jobs), security (customs officers), nuclear industry (work with isotopes)
Latency period	Minimum five years; commonly at least 15 to 20 years.
Main external non-occupational risk factors	Diet.

LIVER CANCER

Description	Primary malignant disease of the liver (it excludes metastases to the liver from primary cancers elsewhere in the body.)
Exposure	HBV or HCV exposure related to occupation, vinyl chloride monomer
High risk occupation or industry	People whose job brings them in contact with body fluids in situations where there is a considerable risk of the worker having a break in their skin through which the infection could enter, such as health care workers, persons who handle body substances, embalmers, clinical laboratory staff, workers in long-term correctional facilities, police, members of the armed forces, emergency services workers and tattooists. Exposure to vinyl chloride monomer occurs through manufacturing of polyvinyl chloride and especially cleaning of autoclaves.
Latency period	Minimum five years; commonly at least 15 to 20 years.
Main external non-occupational risk factors	Alcohol (cirrhosis).

CANCER OF THE NASAL CAVITY AND PARA-NASAL SINUSES

Description	Malignant disease of the nasal cavity and para-nasal sinuses
Exposure	Ionizing radiation, leather dust, nickel, wood dust
High risk occupation or industry	<p>Ionizing radiation would be expected to be very well controlled in Australia but is relevant for anyone whose occupation potentially exposes them to x-rays on a regular basis, which can occur in a range of settings—health (radiographers, radiologists, radiotherapists, dentists), manufacturing and industry (various specific jobs), security (customs officers), nuclear industry (work with isotopes).</p> <p>Leather dust: workers involved in manufacture of footwear and in the leather-tanning and -processing industry.</p> <p>Nickel: Workers involved with commercial and industrial machinery and equipment repair and maintenance, motor vehicle parts manufacturing, and architectural and structural metals manufacturing</p> <p>Wood dust exposure is most likely in workers involved in wood processing (workers in pulp and paper mills, sawmills, veneer and plywood plants, woodchip operations), people who use wood (joineries, furniture manufacturing, other timber product manufacturing, carpentry, roofing, flooring, maintenance work) and people who otherwise work with wood (tree-loppers and chainsaw operators)</p>
Latency period	Minimum five years; commonly at least 15 to 20 years.
Main external non-occupational risk factors	-

LARYNGEAL CANCER

Description	Malignant disease of the larynx.
Exposure	Acid mist—strong inorganic, asbestos.
High risk occupation or industry	<p>Acid mist exposure—there is a potential for high exposure in workers involved in the manufacturing, use and transport of sulfuric acid and isopropanol and metal pickling; moderate exposure in soap and detergent production, and the manufacture of nitric acid and ethanol; low exposure in lead-acid battery manufacturing and phosphate fertilizer production</p> <p>Asbestos exposure can occur through mining (no longer in Australia), transport (truck drivers, dock workers—no longer in Australia except for transport of material contaminated with asbestos), manufacturing (no longer in Australia), contact with asbestos products through construction, maintenance or demolition (carpenters, boilermakers, plumbers, demolition workers).</p>
Latency period	Minimum five years; commonly at least 15 to 20 years.
Main external non-occupational risk factors	Smoking.

CARCINOMA OF THE LUNG

Description	Malignant disease of the respiratory tree and gas exchange areas of the lung.
Exposure	Arsenic, asbestos, beryllium, bis(chloromethyl) ether, cadmium, chromium VI, diesel engine exhaust, ETS, Ionizing radiation, nickel, PAHs, Radon-222 and its decay products, Silica dust (crystalline), Soot (chimney sweeping).
High risk occupation or industry	<p>Arsenic: workers exposed through mining, manufacturing (treated timbers, non-ferrous metal production and processing, iron and steel milling), or use of products containing arsenic (carpenters, oil and gas extraction, water and sewage).</p> <p>Asbestos: Asbestos exposure can occur through mining (no longer in Australia), transport (truck drivers, dock workers—no longer in Australia except for transport of material contaminated with asbestos), manufacturing (no longer in Australia), contact with asbestos products through construction, maintenance or demolition (carpenters, boilermakers, plumbers, demolition workers).</p>

CARCINOMA OF THE LUNG

High risk occupation or industry	<p>Beryllium: Uncommon exposure. Workers most at risk of exposure are construction trades workers, welders, electricians, and dental technologists.</p> <p>Bis(chloromethyl)ether: Exposure is uncommon but can occur during chemical manufacturing.</p> <p>Cadmium: Exposure can occur to welders, automotive service technicians and saw-filers.</p> <p>Chromium VI: Exposure can occur to welders, machinists, automotive service technicians and workers in saw mills treating timbers.</p> <p>Diesel engine exhaust: Exposure can occur to workers operating equipment with diesel engines or working near where diesel equipment operates—truck and bus drivers, heavy equipment operators, forklift operators, non-metal miners, car mechanics.</p> <p>ETS: Hospitality workers, outdoor workers.</p> <p>Ionizing radiation: Ionizing radiation would be expected to be very well controlled in Australia but is relevant for anyone whose occupation potentially exposes them to x-rays on a regular basis, which can occur in a range of settings—health (radiographers, radiologists, radiotherapists, dentists), manufacturing and industry (various specific jobs), security (customs officers), nuclear industry (work with isotopes).</p> <p>Nickel: Workers involved with commercial and industrial machinery and equipment repair and maintenance, motor vehicle parts manufacturing, and architectural and structural metals manufacturing.</p> <p>PAHs: There are a wide range of potential exposure circumstances. Exposures mainly occur through cooking (chefs and cooks); use of fuels (mechanics); and in heavy industry (coal tar production and distillation, coal gasification, coke production); and in a range of other work circumstances (paving and roofing using coal tar, creosote wood preservation, aluminium production, carbon electrode manufacture, mining, metal working, calcium carbide production, petroleum industries, chemical production and transportation, electrical industries and chimney sweeping).</p>
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CARCINOMA OF THE LUNG

High risk occupation or industry	Radon-222 and its decay products: Rare in Australia. Exposure can occur to workers involved in underground mining or other underground work. Silica dust (crystalline): Exposure can occur to workers involved in construction, especially excavators; mining; brick, concrete or stone cutting; abrasive blasting; foundry casting. Soot (chimney sweeping): Chimney sweeps.
Latency period	Minimum five years; commonly at least 15 to 20 years.
Main external non-occupational risk factors	Smoking.

BONE CANCER

Description	Malignant disease of the bone.
Exposure	Ionizing radiation.
High risk occupation or industry	Ionizing radiation would be expected to be very well controlled in Australia but is relevant for anyone whose occupation potentially exposes them to x-rays on a regular basis, which can occur in a range of settings—health (radiographers, radiologists, radiotherapists, dentists), manufacturing and industry (various specific jobs), security (customs officers), nuclear industry (work with isotopes).
Latency period	Minimum five years; commonly at least 15 to 20 years.
Main external non-occupational risk factors	-

SKIN CANCER (MELANOMA)

Description	Malignant disease of the melanin-producing cells in the skin.
Exposure	Solar radiation, polychlorinated biphenyls (PCBs).

SKIN CANCER (MELANOMA)

High risk occupation or industry	Solar radiation: Outdoor workers are at most at risk. PCBs: Uncommon exposure. Exposure can occur to workers coming into contact with electrical fittings (industrial electricians, electrical power line and cable workers, electrical mechanics, and electricians); workers involved in disposal of such material (waste storage, incineration and contaminated site remediation); welders and general maintenance workers; fire-fighters.
Latency period	Minimum five years; commonly at least 15 to 20 years.
Main external non-occupational risk factors	Non-occupational sun exposure.

SKIN CANCER (NON-MELANOMA)

Description	Malignant disease of the cells making up the skin.
Exposure	Solar radiation.
High risk occupation or industry	Solar radiation: Outdoor workers are at most at risk.
Latency period	Minimum five years; commonly at least 15 to 20 years.
Main external non-occupational risk factors	Non-occupational sun exposure.

MALIGNANT MESOTHELIOMA

Description	Malignant disease of the inside lining of the chest wall (pleura), pericardium and abdomen (peritoneum).
Exposure	Asbestos.
High risk occupation or industry	Asbestos: Asbestos exposure can occur through mining (no longer in Australia), transport (truck drivers, dock workers—no longer in Australia except for transport of material contaminated with asbestos), manufacturing (no longer in Australia), contact with asbestos products through construction, maintenance or demolition (carpenters, boilermakers, plumbers, demolition workers).
Latency period	Minimum five years; commonly at least 20 to 25 years.
Main external non-occupational risk factors	-

BREAST CANCER

Description	Malignant disease of the breast.
Exposure	Ionizing radiation.
High risk occupation or industry	Ionizing radiation would be expected to be very well controlled in Australia but is relevant for anyone whose occupation potentially exposes them to x-rays on a regular basis, which can occur in a range of settings—health (radiographers, radiologists, radiotherapists, dentists), manufacturing and industry (various specific jobs), security (customs officers), nuclear industry (work with isotopes).
Latency period	Minimum five years; commonly at least 15 to 20 years.
Main external non-occupational risk factors	Alcohol, female hormones.

OVARIAN CANCER

Description	Malignant disease of the ovary.
Exposure	Asbestos.
High risk occupation or industry	Asbestos: Asbestos exposure can occur through mining (no longer in Australia), transport (truck drivers, dock workers—no longer in Australia except for transport of material contaminated with asbestos), manufacturing (no longer in Australia), contact with asbestos products through construction, maintenance or demolition (carpenters, boilermakers, plumbers, demolition workers).
Latency period	Minimum five years; commonly at least 15 to 20 years.
Main external non-occupational risk factors	-

RENAL CANCER (CANCER OF THE KIDNEY)

Description	Malignant disease of the kidney.
Exposure	Ionizing radiation, trichloroethylene.
High risk occupation or industry	<p>Ionizing radiation would be expected to be very well controlled in Australia but is relevant for anyone whose occupation potentially exposes them to x-rays on a regular basis, which can occur in a range of settings—health (radiographers, radiologists, radiotherapists, dentists), manufacturing and industry (various specific jobs), security (customs officers), nuclear industry (work with isotopes).</p> <p>Trichloroethylene: Exposure occurs particularly to workers involved in degreasing—metal product manufacturing, electroplating, metal spraying, metal fabrication.</p>
Latency period	Minimum five years; commonly at least 15 to 20 years.
Main external non-occupational risk factors	Smoking.

BLADDER CANCER

Description	Malignant disease of urothelial tissue lining the urinary tract.
Exposure	2-naphthylamine, benzidine, cyclophosphamide, ionizing radiation, ortho-toluidine, PAHs.
High risk occupation or industry	<p>2-naphthylamine, benzidine and ortho-toluidine: Workers involved in the production of azo dyes (this no longer occurs in Australia).</p> <p>Cyclophosphamide: Oncology nurses and pharmacists involved in preparing or administering cyclophosphamide for use with patients.</p> <p>Ionizing radiation would be expected to be very well controlled in Australia but is relevant for anyone whose occupation potentially exposes them to x-rays on a regular basis, which can occur in a range of settings—health (radiographers, radiologists, radiotherapists, dentists), manufacturing and industry (various specific jobs), security (customs officers), nuclear industry (work with isotopes).</p> <p>PAHs: There are a wide range of potential exposure circumstances. Exposures mainly occur through cooking (chefs and cooks); use of fuels (mechanics); and in heavy industry (coal tar production and distillation, coal gasification, coke production); and in a range of other work circumstances (paving and roofing using coal tar, creosote wood preservation, aluminium production, carbon electrode manufacture, mining, metal working, calcium carbide production, petroleum industries, chemical production and transportation, electrical industries and chimney sweeping).</p>
Latency period	Minimum five years; commonly at least 15 to 20 years.
Main external non-occupational risk factors	Smoking.

BRAIN CANCER

Description	Malignant disease of the brain.
Exposure	Ionizing radiation.
High risk occupation or industry	Ionizing radiation would be expected to be very well controlled in Australia but is relevant for anyone whose occupation potentially exposes them to x-rays on a regular basis, which can occur in a range of settings—health (radiographers, radiologists, radiotherapists, dentists), manufacturing and industry (various specific jobs), security (customs officers), nuclear industry (work with isotopes).
Latency period	Minimum five years; commonly at least 15 to 20 years.
Main external non-occupational risk factors	-

THYROID CANCER

Description	Malignant disease of the thyroid.
Exposure	Ionizing radiation.
High risk occupation or industry	Ionizing radiation would be expected to be very well controlled in Australia but is relevant for anyone whose occupation potentially exposes them to x-rays on a regular basis, which can occur in a range of settings—health (radiographers, radiologists, radiotherapists, dentists), manufacturing and industry (various specific jobs), security (customs officers), nuclear industry (work with isotopes).
Latency period	Minimum five years; commonly at least 15 to 20 years.
Main external non-occupational risk factors	-

LEUKAEMIA

Description	Malignant disease of a subset of white blood cells.
Exposure	Benzene, butadiene, cyclophosphamide, formaldehyde, HCV exposure related to occupation, ionizing radiation.
High risk occupation or industry	<p>Benzene: Exposure is primarily through exposure to fuels (automotive service technicians and mechanics, delivery and courier drivers, taxi, and firefighters) and through manufacturing or use of products with small amounts of benzene (steel workers, printers, rubber workers, shoe makers)</p> <p>Butadiene: Exposure is primarily to machine operators in the rubber and plastic processing industry.</p> <p>Cyclophosphamide: Oncology nurses and pharmacists involved in preparing or administering cyclophosphamide for use with patients.</p> <p>Formaldehyde: Formaldehyde exposure is most likely in embalmers, forensic/hospital mortuary workers, pathology laboratory workers, formaldehyde resin manufacturers, users and packers.</p> <p>HCV: People whose job brings them in contact with body fluids in situations where there is a considerable risk of the worker having a break in their skin through which the infection could enter, such as health care workers, persons who handle body substances, embalmers, clinical laboratory staff, workers in long-term correctional facilities, police, members of the armed forces, emergency services workers and tattooists.</p> <p>Ionizing radiation: Ionizing radiation would be expected to be very well controlled in Australia but is relevant for anyone whose occupation potentially exposes them to x-rays on a regular basis, which can occur in a range of settings—health (radiographers, radiologists, radiotherapists, dentists), manufacturing and industry (various specific jobs), security (customs officers), nuclear industry (work with isotopes).</p>
Latency period	Minimum one year; commonly at least 10 to 15 years.
Main external non-occupational risk factors	Smoking.

NON-HODGKINS LYMPHOMA

Description	Malignant disease of a subset of white blood cells.
Exposure	Ionizing radiation.
High risk occupation or industry	Ionizing radiation would be expected to be very well controlled in Australia but is relevant for anyone whose occupation potentially exposes them to x-rays on a regular basis, which can occur in a range of settings—health (radiographers, radiologists, radiotherapists, dentists), manufacturing and industry (various specific jobs), security (customs officers), nuclear industry (work with isotopes).
Latency period	Minimum one year; commonly at least 10 to 15 years.
Minimum exposure	-
Main external non-occupational risk factors	Smoking.

Neurological diseases

PARKINSON'S DISEASE

Description	Neurodegenerative disease of the central nervous system associated with tremor, stiff limbs and difficulty moving.
Exposure	Manganese.
High risk occupation or industry	Manganese exposure is probably highest in welding and some metal workers.
Latency period	Probably years.
Main external non-occupational risk factors	-

PERIPHERAL NEUROPATHY

Description	A group of diseases characterised by temporary or permanent damage to nerves outside the central nervous system.
Exposure	Metals such as lead, mercury and arsenic; organic solvents such as n-hexane, carbon disulphide and trichloroethylene; pesticides such as organophosphates; acrylamide.
High risk occupation or industry	Exposures can occur in a wide range of industrial settings, particularly manufacturing.
Latency period	Weeks to years
Main external non-occupational risk factors	Alcohol.

Noise-induced hearing loss

NOISE-INDUCED HEARING LOSS

Description	A permanent, degenerative disease of the inner ear characterised by loss of auditory acuity, particularly in the high frequency range.
Exposure	Noise above 85dB(A).
High risk occupation or industry	Any occupation which involves sustained exposure to loud noise.
Latency period	Years.
Main external non-occupational risk factors	Non-occupational noise.

Respiratory diseases

OCCUPATIONAL ASTHMA

Description	Reversible narrowing of the small and medium airways in the lung which causes shortness of breath as a result of exposure to one or more workplace agents.
Exposure	Sensitising agents or irritants—arthropods or mites, biological enzymes, bioaerosols, derived from fish/shellfish, derived from animals, flour, sensitising foods, flowers, latex, wood dusts, soldering, reactive dyes, anhydrides, acrylates, epoxy, ethylene oxide, aldehydes, pesticides, amines, ammonia, industrial cleaning agents, acids, isocyanates, other reactive chemicals, sensitising metals, sensitising drugs*
High risk occupation or industry	A wide range of occupations, particularly involving manufacturing, construction and agriculture
Latency period	Variable, from days to months.
Main external non-occupational risk factors	Asthma is a common condition in the general community.

*: The large number of occupational agents that have been shown to cause these diseases means that it is impractical to list every relevant agent.

PNEUMOCONIOSES

Description	Fibrotic lung disease caused by exposure to dusts
Exposure	Coal, asbestos, silica and a range of other dusts.
High risk occupation or industry	Coal: Coal miners. Asbestos: Exposure can occur through mining, transport (truck drivers, dock workers), manufacturing, construction, maintenance or demolition (carpenters, boilermakers, plumbers, demolition workers). Silica dust (crystalline): Exposure can occur to workers involved in construction, especially excavators; mining; brick, concrete or stone cutting; abrasive blasting; foundry casting. Other dusts: Exposure to other dusts can occur in a range of occupations, usually in manufacturing.
Latency period	Years.
Main external non-occupational risk factors	-

BYSSINOSIS

Description	Asthma-like condition (reversible narrowing of the small and medium airways in the lung which causes shortness of breath).
Exposure	Cotton, hemp, flax or sisal dust.
High risk occupation or industry	Exposure is most likely in manufacturing workers working with these agents.
Latency period	Variable, from days to months.
Main external non-occupational risk factors	Very rare.

EXTRINSIC ALLERGIC ALVEOLITIS

Description	Disease of the alveoli (the gas-exchange spaces in the lung), causing shortness of breath. Initially can be cured but can develop a chronic component.
Exposure	A wide range of occupational exposures.
High risk occupation or industry	A wide range of occupations, particularly involving manufacturing, construction and agriculture.
Latency period	Variable, from days to months.
Main external non-occupational risk factors	A wide range possible but not common.

Hepatic diseases

NON-INFECTIOUS HEPATITIS

Description	Acute inflammation of the liver due to non-infectious agents.
Exposure	Agents known to cause hepatitis (particularly organic solvents).
High risk occupation or industry	A wide range of occupations, particularly involving manufacturing and construction.
Latency period	Variable, from days to months.
Main external non-occupational risk factors	Uncommon.

CHRONIC ACTIVE HEPATITIS

Description	Prolonged (greater than six months) on-going inflammation of the liver.
Exposure	Persons with known HBV or HCV related to occupation.
High risk occupation or industry	People whose job brings them in contact with body fluids in situations where there is a considerable risk of the worker having a break in their skin through which the infection could enter, such as health care workers, persons who handle body substances, embalmers, clinical laboratory staff, workers in long-term correctional facilities, police, members of the armed forces, emergency services workers and tattooists.
Latency period	Months to years
Main external non-occupational risk factors	A considerable minority of Australian persons are carriers of HBV or HCV and potentially infectious. The main cause of on-going liver disease is alcohol.

HEPATIC CIRRHOSIS

Description	Chronic fibrotic disease of the liver where damaged liver cells have been replaced by scar tissue.
Exposure	Persons with known HBV or HCV related to occupation.
High risk occupation or industry	People whose job brings them in contact with body fluids in situations where there is a considerable risk of the worker having a break in their skin through which the infection could enter, such as health care workers, persons who handle body substances, embalmers, clinical laboratory staff, workers in long-term correctional facilities, police, members of the armed forces, emergency services workers and tattooists.
Latency period	Years.
Main external non-occupational risk factors	A considerable minority of Australian persons are carriers of HBV or HCV and potentially infectious. The main cause of cirrhotic liver disease is alcohol.

Skin diseases

IRRITANT AND ALLERGIC CONTACT DERMATITIS

Description	Dermatitis is an inflammatory disease of the skin. In an occupational setting it mainly occurs on the hands.
Exposure	A wide range of sensitising agents or irritants. Irritant contact dermatitis in an occupational setting is most commonly reported as due to alcohols, cutting fluids, degreasers, disinfectants, petroleum products, soaps and cleaners, solvents and wet work. Allergic contact dermatitis in an occupational setting is most frequently reported as being due to chromates, cobalt, cosmetics and fragrances, epoxy resin, latex, nickel, plants, preservatives, resins and acrylics.
High risk occupation or industry	Exposure can occur in many occupations, but particularly agricultural workers, beauticians, chemical workers, cleaners, construction workers, cooks and caterers, electronics workers, hairdressers, health care workers, machine operators, mechanics, metalworkers and vehicle assemblers.
Latency period	Variable, from days to months.
Main external non-occupational risk factors	Dermatitis is a common condition in the general community.

VITILIGO

Description	A disease where the melanin-producing cells in the skin, mucous membranes and/or eye are damaged, with loss of pigment resulting in white patches on the skin or other affected areas.
Exposure	Para-tertiary-butylphenol; para-tertiary-butylcatechol; para-amylphenol; hydroquinone or the monobenzyl or monobutyl ether of hydroquinone.
High risk occupation or industry	Exposure is unusual but most common in manufacturing workers.
Latency period	Variable; weeks to years
Main external non-occupational risk factors	-

Musculoskeletal diseases

RAYNAUD'S DISEASE

Description	Intermittent spasm of the arteries of the hands or feet, causing pain due to decreased blood flow to the affected area.
Exposure	Vibration, hammer drills, hand-held portable grinders and jigsaws.
High risk occupation or industry	A wide range of occupations that involve the relevant exposures.
Latency period	Weeks to years.
Main external non-occupational risk factors	Uncommon condition with no other clear external causes.

BURSITIS (AT THE ELBOW OR KNEE)

Description	Pain, tenderness and sometimes swelling just above or below the knee or behind the elbow, worse with movement, due to inflammation of the relevant bursa.
Exposure	Prolonged external friction or pressure or repetitive motion at or about the elbow or the knee.
High risk occupation or industry	A wide range of occupations that involve the relevant movements.
Latency period	Weeks to years.
Main external non-occupational risk factors	Occurs occasionally in the general community.

Acute poisoning / toxicity

ACUTE POISONING / TOXICITY

Description	Poisoning causing damage to one or more of the heart, lungs, liver, kidney, nervous system and blood).
Exposure	Acrylonitrile; alcohols; antimony; arsenic; benzene; beryllium; cadmium; carbon disulphide; chromium; copper; fluorine; alcohol, glycols or ketones; hexane; lead; manganese; mercury; mineral acids; nitroglycerine (or other nitric acid esters); osmium; oxides of nitrogen; ozone; pesticides (organophosphate and organochlorine compounds), herbicides and related compounds; pharmaceutical agents; phosgene; phosphorus; selenium; styrene; thallium; tin; toluene; vanadium; zinc; chemical asphyxiants (carbon monoxide, hydrogen cyanide, hydrogen sulphide, methylene chloride); irritants (benzoquinone and other corneal irritants); toxic halogen derivatives of aliphatic or aromatic hydrocarbons; toxic nitro- and amino-derivatives of benzene (and other less common, specific substances not included here).
High risk occupation or industry	A wide range of occupations, particularly in manufacturing.
Latency period	Minutes to hours (typically).
Main external non-occupational risk factors	Instances due to non-occupational exposure are uncommon.



MAPPING OF ILO
LIST TO LIST OF
DEEMED DISEASES

8.1 INTRODUCTION

Most jurisdictional lists associated with Deemed Diseases legislation appear to have been originally based on the ILO List of Classified Diseases originally presented in Convention 42. Australia is a signatory to ILO Convention 42. A comparison of the Convention 42 with the proposed List is shown in Table 8.1.

The comparison in Table 8.1 reveals that many of the categories listed in the ILO List are not included in the current version of the List. Also, the ILO List does not include many diseases that can definitely arise due to occupational exposures.

ILO Recommendation 194, revised in 2002, provides a more comprehensive list. ILO Recommendation 194 recommended that countries include as many of the diseases in the Annex as possible in their list of diseases that should be the basis for compensation. A comparison with it is shown in Table 8.2.

Table 8.1 Comparison of ILO Schedule 42 List of Occupational Diseases and the proposed Deemed Diseases List

CONVENTION 42 OCCUPATIONAL DISEASES	DEEMED DISEASES
Poisoning by lead, its alloys or compounds and their sequelae	Peripheral neuropathy; renal failure; acute poisoning
Poisoning by mercury, its amalgams and compounds and their sequelae.	Peripheral neuropathy; renal failure; acute poisoning
Anthrax infection.	Anthrax
Silicosis with or without pulmonary tuberculosis, provided that silicosis is an essential factor in causing the resultant incapacity or death.	Silicosis
Phosphorous poisoning by phosphorous or its compounds, and its sequelae.	Acute poisoning
Arsenic poisoning by arsenic or its compounds, and its sequelae.	Peripheral neuropathy; acute poisoning
Poisoning by benzene or its homologues, their nitro- and amido-derivatives, and its sequelae.	Acute poisoning
Poisoning by the halogen derivatives of hydrocarbons of the aliphatic series.	Peripheral neuropathy; non-infectious hepatitis, acute poisoning
Pathological manifestations due to: a) radium and other radioactive substances; b) X-rays	Various cancers
Primary epitheliomatous cancer of the skin	Skin cancer

Table 8.2 Comparison of ILO Recommendation 194 List of Occupational Diseases and the proposed Deemed Diseases List

RECOMMENDATION 194 OCCUPATIONAL DISEASES	DEEMED DISEASES
DISEASES CAUSED BY CHEMICAL AGENTS	
Diseases caused by beryllium or its toxic compounds	Lung cancer; pneumoconiosis; acute poisoning
Diseases caused by cadmium or its toxic compounds	Lung cancer; acute renal failure; acute poisoning
Diseases caused by phosphorus or its toxic compounds	Acute poisoning
Diseases caused by chromium or its toxic compounds	Lung cancer; acute renal failure; acute poisoning
Diseases caused by manganese or its toxic compounds	Parkinson's disease; acute poisoning
Diseases caused by arsenic or its toxic compounds	Lung cancer; peripheral neuropathy; acute poisoning
Diseases caused by mercury or its toxic compounds	Peripheral neuropathy; acute renal failure; acute poisoning
Diseases caused by lead or its toxic compounds	Peripheral neuropathy; acute renal failure; acute poisoning
Diseases caused by fluorine or its toxic compounds	Acute poisoning
Diseases caused by carbon disulfide	Peripheral neuropathy; acute poisoning
Diseases caused by the toxic halogen derivatives of aliphatic or aromatic hydrocarbons	Kidney cancer; peripheral neuropathy; non-infectious hepatitis, acute poisoning
Diseases caused by benzene or its toxic homologues	Leukaemia; acute poisoning
Diseases caused by toxic nitro- and amino-derivatives of benzene or its homologues	Acute poisoning
Diseases caused by nitroglycerin or other nitric acid esters	Acute poisoning
Diseases caused by alcohols, glycols or ketones	Acute poisoning
Diseases caused by asphyxiants: carbon monoxide, hydrogen cyanide or its derivatives	Acute poisoning
Diseases caused by acrylonitrile	Acute poisoning
Diseases caused by oxides of nitrogen	Acute poisoning
Diseases caused by vanadium or its compounds	Acute poisoning
Diseases caused by antimony or its compounds	Acute poisoning
Diseases caused by hexane	Acute poisoning

RECOMMENDATION 194 OCCUPATIONAL DISEASES	DEEMED DISEASES
Diseases caused by mineral acids	Acute poisoning
Diseases caused by pharmaceutical agents	Acute poisoning
Diseases caused by nickel or its compounds	Nasal cavity and para-nasal sinus cancer; lung cancer; contact dermatitis
Diseases caused by thallium or its compounds	Acute poisoning
Diseases caused by osmium or its compounds	Acute poisoning
Diseases caused by selenium or its compounds	Acute poisoning
Diseases caused by copper or its compounds	Acute poisoning; contact dermatitis
Diseases caused by platinum or its compounds	Acute poisoning (platinum not explicitly named)
Diseases caused by tin or its compounds	Acute poisoning
Diseases caused by zinc or its compounds	Acute poisoning
Diseases caused by phosgene	Acute poisoning
Diseases caused by corneal irritants like benzoquinone	Acute poisoning
Diseases caused by ammonia	Asthma
Diseases caused by isocyanates	Asthma
Diseases caused by pesticides	Peripheral neuropathy; asthma; acute poisoning
Diseases caused by sulphur oxides	Not included
Diseases caused by organic solvents	Kidney cancer; peripheral neuropathy; non-infectious hepatitis, acute poisoning
Diseases caused by latex or latex-containing products	Asthma; dermatitis
Diseases caused by chlorine	Asthma; acute poisoning;
Diseases caused by other chemical agents at work not mentioned in the preceding items where a direct link is established scientifically, or determined by methods appropriate to national conditions and practice, between the exposure to these chemical agents arising from work activities and the disease(s) contracted by the worker	Asthma; dermatitis; acute renal failure; acute poisoning

RECOMMENDATION 194 OCCUPATIONAL DISEASES	DEEMED DISEASES
DISEASES CAUSED BY PHYSICAL AGENTS	
Hearing impairment caused by noise	Noise-induced hearing loss
Diseases caused by vibration (disorders of muscles, tendons, bones, joints, peripheral blood vessels or peripheral nerves)	Raynaud's disease
Diseases caused by compressed or decompressed air	N/A—injury
Diseases caused by ionizing radiations	Various cancers
Diseases caused by optical (ultraviolet, visible light, infrared) radiations including laser	Skin cancer; melanoma
Diseases caused by exposure to extreme temperatures	N/A—injury
Diseases caused by other physical agents at work not mentioned in the preceding items where a direct link is established scientifically, or determined by methods appropriate to national conditions and practice, between the exposure to these physical agents arising from work activities and the disease(s) contracted by the worker	N/A—injury
BIOLOGICAL AGENTS AND INFECTIOUS OR PARASITIC DISEASES	
Brucellosis	Brucellosis
Hepatitis viruses	Hepatitis A, B and C, chronic active hepatitis; hepatic cirrhosis (in selected occupation groups)
Human immunodeficiency virus (HIV)	HIV (in selected occupation groups)
Tetanus	Not included
Tuberculosis	Tuberculosis (in selected occupation groups)
Toxic or inflammatory syndromes associated with bacterial or fungal contaminants	Byssinosis; extrinsic allergic alveolitis
Anthrax	Anthrax
Leptospirosis	Lepstospirosis
Diseases caused by other biological agents at work not mentioned in the preceding items where a direct link is established scientifically, or determined by methods appropriate to national conditions and practice, between the exposure to these biological agents arising from work activities and the disease(s) contracted by the worker	Brucellosis, Q-fever, orf

RECOMMENDATION 194 OCCUPATIONAL DISEASES	DEEMED DISEASES
RESPIRATORY DISEASES	
Pneumoconioses caused by fibrogenic mineral dust (silicosis, anthraco-silicosis, asbestosis)	Silicosis, asbestosis
Silicotuberculosis	Silicosis
Pneumoconioses caused by non-fibrogenic mineral dust	Coal workers' pneumoconiosis; other specific pneumoconioses
Siderosis	Siderosis (under the general category of 'Other pneumoconiosis')
Bronchopulmonary diseases caused by hard-metal dust	Included with pneumoconioses
Bronchopulmonary diseases caused by dust of cotton (byssinosis), flax, hemp, sisal or sugar cane (bagassosis)	Byssinosis
Asthma caused by recognized sensitizing agents or irritants inherent to the work process	Asthma
Extrinsic allergic alveolitis caused by the inhalation of organic dusts or microbially contaminated aerosols, arising from work activities	Extrinsic allergic alveolitis
Chronic obstructive pulmonary diseases caused by inhalation of coal dust, dust from stone quarries, wood dust, dust from cereals and agricultural work, dust in animal stables, dust from textiles, and paper dust, arising from work activities	Not included
Diseases of the lung caused by aluminium	Under the general category of 'Other pneumoconiosis'
Upper airways disorders caused by recognized sensitizing agents or irritants inherent to the work process	Not included
Other respiratory diseases not mentioned in the preceding items where a direct link is established scientifically, or determined by methods appropriate to national conditions and practice, between the exposure to risk factors arising from work activities and the disease(s) contracted by the worker	Not included

RECOMMENDATION 194 OCCUPATIONAL DISEASES	DEEMED DISEASES
SKIN DISEASES	
Allergic contact dermatoses and contact urticaria caused by other recognized allergy provoking agents arising from work activities not included in other items	Contact dermatitis associated with sensitising agents
Irritant contact dermatoses caused by other recognized irritant agents arising from work activities not included in other items	Contact dermatitis associated with irritants
Vitiligo caused by other recognized agents arising from work activities not included in other items	Vitiligo associated with para-tertiary-butylphenol; para-tertiary-butylcatechol; para-amyphenol; hydroquinone or the monobenzyl or monobutyl ether of hydroquinone
Other skin diseases caused by physical, chemical or biological agents at work not included under other items where a direct link is established scientifically, or determined by methods appropriate to national conditions and practice, between the exposure to risk factors arising from work activities and the skin disease(s) contracted by the worker	Not included
MUSCULOSKELETAL DISORDERS	
Radial styloid tenosynovitis due to repetitive movements, forceful exertions and extreme postures of the wrist	Not included
Chronic tenosynovitis of hand and wrist due to repetitive movements, forceful exertions and extreme postures of the wrist	Not included
Olecranon bursitis due to prolonged pressure of the elbow region	Bursitis (at the elbow or knee)
Prepatellar bursitis due to prolonged stay in kneeling position	Bursitis (at the elbow or knee)
Epicondylitis due to repetitive forceful work	Not included
Meniscus lesions following extended periods of work in a kneeling or squatting position	Not included
Carpal tunnel syndrome due to extended periods of repetitive forceful work, work involving vibration, extreme postures of the wrist, or a combination of the three	Not included

RECOMMENDATION 194 OCCUPATIONAL DISEASES**DEEMED DISEASES**

Other musculoskeletal disorders not mentioned in the preceding items where a direct link is established scientifically, or determined by methods appropriate to national conditions and practice, between the exposure to risk factors arising from work activities and the musculoskeletal disorder(s) contracted by the worker

Not included

CANCER CAUSED BY THE FOLLOWING AGENTS

Asbestos	Laryngeal cancer; lung cancer; malignant mesothelioma; ovarian cancer
Benzidine and its salts	Bladder cancer
Bis-chloromethyl ether (BCME)	Lung cancer
Chromium VI compounds	Lung cancer
Coal tars, coal tar pitches or soots	Lung cancer; skin cancer
Beta-naphthylamine	Bladder cancer
Vinyl chloride	Liver cancer
Benzene	Leukaemia
Toxic nitro- and amino-derivatives of benzene or its homologues	Not included
Ionizing radiations	Various cancer
Tar, pitch, bitumen, mineral oil, anthracene, or the compounds, products or residues of these substances	Skin cancer
Coke oven emissions	Lung cancer
Nickel compounds	Lung cancer; nasal cavity and para-nasal sinus cancer
Wood dust	Nasal cavity and para-nasal sinus cancer
Arsenic and its compounds	Lung cancer
Beryllium and its compounds	Lung cancer
Cadmium and its compounds	Lung cancer
Erionite	Not included
Ethylene oxide	Not included
Hepatitis B virus (HBV) and hepatitis C virus (HCV)	Liver cancer

RECOMMENDATION 194 OCCUPATIONAL DISEASES	DEEMED DISEASES
<p>Cancers caused by other agents at work not mentioned in the preceding items where a direct link is established scientifically, or determined by methods appropriate to national conditions and practice, between the exposure to these agents arising from work activities and the cancer(s) contracted by the worker</p>	<p>Nasopharyngeal cancer and formaldehyde, wood dust</p> <p>Nasal cavity and para-nasal sinus cancer and wood dust</p> <p>Larynx and acid mist—strong inorganic</p> <p>Lung cancer and diesel engine exhaust, environmental tobacco smoke, silica (crystalline)</p> <p>Melanoma and polychlorinated biphenyls</p> <p>Kidney cancer and trichloroethylene</p> <p>Leukaemia and butadiene, formaldehyde, HCV exposure related to occupation</p>
OTHER DISEASES	
Miners' nystagmus	Not included
<p>Other specific diseases caused by occupations or processes not mentioned in this list where a direct link is established scientifically, or determined by methods appropriate to national conditions and practice, between the exposure arising from work activities and the disease(s) contracted by the worker</p>	Not included

The background is a solid dark blue color. It features several thin white lines that create a geometric pattern. A diagonal line runs from the top-left towards the bottom-right. A vertical line runs from the top-right towards the bottom. Another diagonal line runs from the bottom-left towards the top-right. These lines intersect to form various geometric shapes, including triangles and quadrilaterals. The overall aesthetic is clean and modern.

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